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In this Issue—

BARRINGTON HOOPER, C.B.E.
Death of "Iron and Coal's" Chairman - - page 551

COLLIERY MANAGEMENT
Changes Under Nationalization - - - - page 559

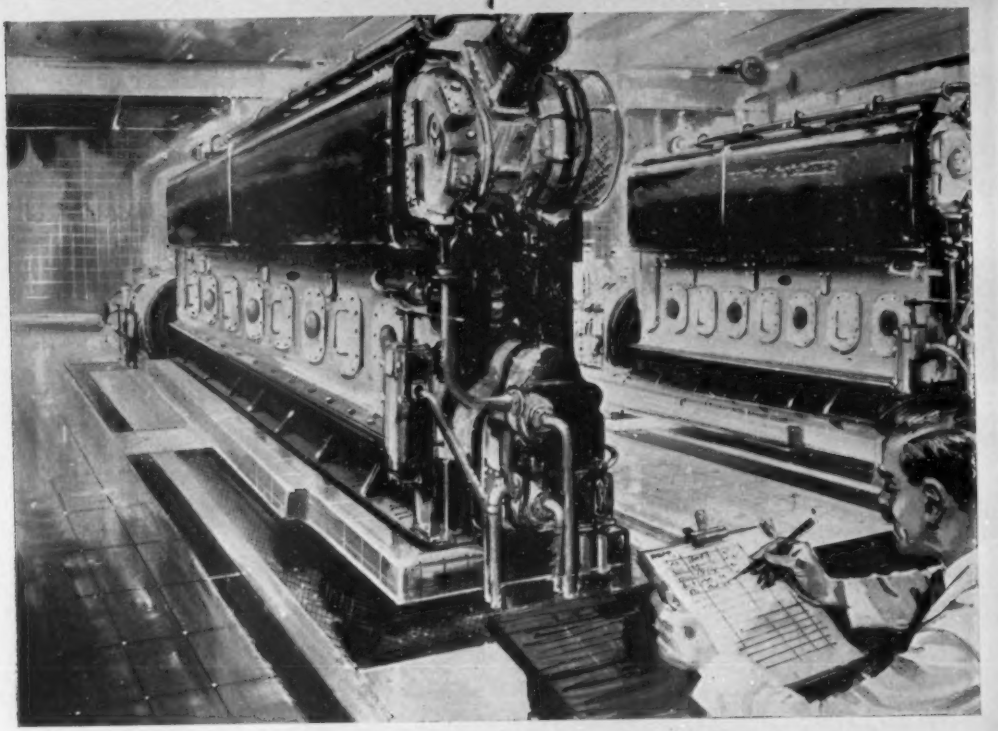
CASTING PIT PRACTICE
BISRA Junior Steelmaking Conference - - - page 563

REVISED PLAN FOR COAL
Implications for Mining Engineers - - - - page 569

FUEL ECONOMY IN STEEL INDUSTRY
Achievements Over 40 Years - - - - - page 573

SURVEYORS AT BANGOR
Annual Conference of the RICS - - - - page 579

	PAGE
Leading Article: Faith in the Future	549
Minister Visits Scots Wire Rope and Machine Tool Firm	549
Costs Rise Forecast by 600 Group Chairman	550
Passing Thoughts	550
New Master Cutler Nominated	552
Recent Wills	552
New Yorkshire Pit	553
Personal	554
New President of the Institution of Mining and Metallurgy	554
Science and Technology	555
Financial Reward, "Chief Incentive in Industry"	555
Appointments	556
New Area Engineers in NCB's Durham Division	556
Can Coal Keep Pace?	557
Durham Coke-oven Workers End Strike	557
New Chief Engineer at SCOW's Trostre Works	558
£11,000,000 Strip Mill for Algoma Steel	558
Forthcoming Events	568
New Literature	568
Scottish Colliery Accidents	571
Electrical Distribution at Agecroft Colliery	572
Defects in Large Castings and Forgings	575
Commercial Production of High-purity Metals	578
Rust Proofing Iron and Steel	578
Mobile Elevating, Screening, and Stocking Plant	580
New Inset and Pit-bottom Circuit at Steetley Colliery	581
Stone Dust Barriers in Mines	582
High-speed Coal-shipping Plants at Immingham	583
New Oil-processing Plant in Poland	583
New Patents	584
Book Review	585
US Coke Output Increased Despite Steel Strike	586
Iron and Steel Trade	587
Double Century for Carblox Blast-furnace Linings	587
Coalfield News	588
The Coal Trade	589
Miner Banned From Holding Union Office	589
Board Changes	590
Major Role For Steel in Booming Investment	590
Company News	591
Support for TUC Action in Wildcat Strikes	592
MI Chairman Clarifies Expansion Plans	592
News in Brief	593
Orders Placed	594
Allied Ironfounders Buys J. S. & F. Folkard	594
Big Expansion Project for Italian Steel	596
Domestic Coal Output Drops: Board Drawing From Stocks	598
Coal Stocks Position	598
Ruston & Hornsby Face Rising Costs	600
Ore Chartering	600
Law Report	600
Yorkshire Coke-oven Workers' Dispute	602
NCB Ideas Competition	602



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IRON AND COAL
TRADES REVIEW

Vol. 181 September 9, 1960 No. 4,808

Faith in the Future

PEOPLE who lived through the recurring economic crises of the years between the wars do not readily believe that the days of alternating booms and slumps are gone for ever. They look at today's employment figures and shake their heads. You know what is running through their minds—the gloomy thought that it cannot last. "What goes up must come down," you can almost hear them saying. When the demand for coal fell in 1958 they could not resist a "What did I tell you!" and when a little later there was a falling off in steel they were convinced that a slump was just around the corner. Such people are not intentionally prophets of doom. More often than not they are themselves riding along happily on the tide of prosperity, helping, indeed, most of them, to achieve still greater prosperity by their own individual business effort. Most of their money is in equities. They have not sold out and put their all in 3½ per cent. War Loan. It is just that in economic thought—and probably only in that—they are living in the past. Their view of what is happening now and is likely to happen in the future, is conditioned by their knowledge of what happened in days gone by.

Caution is inherent in all of us, and perhaps that is not a bad thing, but we shall not attain prosperity unless we believe in it. Belief, of course, is not enough. We get what we deserve, and if we are to be prosperous we must work to make ourselves so. Confidence in the future is nevertheless an essential prerequisite of success, and a very necessary stimulant to endeavour.

Although there are some clouds on the horizon, trade and industry are booming both in Europe and America. Will the boom last? A correspondent of the London Evening Standard asked this question of Sir George Bolton, for years an executive director of the Bank of England and today chairman of the Bank of London and South America and a director, among other enterprises, of the Commonwealth Development Finance Company and the Canadian Pacific Railway. Sir George's response was heartening indeed. "I believe Europe's economic growth is only just beginning," he declared. "Expansion may well go on for the next 10 or 20 years, and at a pace we have never seen before." In this expansion Britain would share and must benefit accordingly, he indicated.

An expression of faith is one thing; making sure belief is turned into fact is another. Convinced of Europe's future, Sir George Bolton, we are told, has built up a network of agents in Europe for financing trade, and has one of the largest foreign exchange turnovers in the City of London. Faith in the future has led Britain's iron and steel manufacturers to embark on the biggest plant expansion programme ever tackled in the history of the industry. Convinced that the demand for steel will exist, it is taking steps in advance to make sure that the tonnage will be there to meet it. At the same time, by market research and sustained sales effort it is striving all the time to stimulate demand and open up new outlets for steel.

British confidence in the future of steel is shared apparently by European producers, who presumably share also Sir George Bolton's optimism, for they, too, are busily putting down new plant. In coal, both the British authorities and their counterparts on the Continent take a view of the future which, if not downright pessimistic, is certainly not inspiring. How far are they right? Can coal languish when steel is flourishing? If Sir George Bolton's belief in expansion in Europe "at a pace never seen before" is substantiated, how can the coal industry possibly remain depressed? With industry expanding energy requirements must grow, and to assume that coal will take no part in fulfilling those increased needs is to admit that competing fuels have advantages that coal cannot match. It also assumes that supplies of oil and natural gas are unlimited, an assumption which expert opinion does not support.

Copies of the Index to Vol. 180 are obtainable (post free) on application to the Publisher.

Minister Visits Scots Wire Rope and Machine Tool Firms

THE Minister of State, Lord Craigton, visited the works of Martin, Black & Company (Wire Ropes), Limited, at Coatbridge, near Glasgow, on Wednesday of last week as part of a tour to gain first-hand information on how he could best assist Scottish firms active in the export field. Lord Craigton was met by the company's joint managing directors, Mr. A. D. Martin and Mr. W. S. Black, and toured the wire drawing mill and ropery.

The Minister also toured the works in Govan of the Scottish Machine Tool Corporation, Limited, which has a large export trade with the Continent and the Far East. He was conducted round the works by Mr. H. M. M. Hyslop, managing director.

Lord Craigton is to visit Sweden this week in search of new trade and reciprocal trade agreements between that country and Scotland. He will spend nine days visiting Swedish industries and talking to industrialists, and will be accompanied by Mr. W. S. Robertson, chief executive officer of the Scottish Council (Development and Industry).

Costs Rise Forecast by 600 Group Chairman

NEW pay increases appear inevitable and will push up the costs in the engineering industry, states Mr. Cyril M. Cohen, chairman of the George Cohen 600 Group, Limited. In his statement to shareholders he says that profit margins "are liable to be lower if we are to hold our competitive position. The next round of general wage claims is in process, so some upward movement in costs appears inevitable during our current financial year."

MR. C. M. COHEN

The group proposes to raise fresh capital by a rights issue of 5,000,000 ordinary 5s. units on a two-for-five basis. The group's turnover increased by 31 per cent. to a record £36,335,490 in the year to March 31, 1960, and this growth is resulting in the necessity for increasing bank borrowings, says the chairman. It is not the board's policy to regard bank overdrafts as permanent finance, and having this in mind, also plans for development, the directors have decided the time has come to introduce fresh capital.

On the current year's outlook, Mr. Cohen says it is difficult to forecast even within a reasonable degree of accuracy, but he considers the board's budget for a maintained profit to be a fair assessment. Group trading profit for 1959-60 improved from £1,230,310 to £1,478,857—"an outcome much better than I felt justified in predicting 12 months ago," he declares. There was a slight further reduction in the profit ratio.

A marked improvement in the merchanting business and an upsurge in the demand for machine tools appreciably contributed to the rise in profits, but results of the structural and civil engineering activities were disappointing.

The beginning of the year was affected by the continued recession in the capital goods industries. Orders in hand, both in the foundry and the engineering divisions, of K. & L. Steelfounders & Engineers, Limited, were at a lower level than for a long while, but due to an improved demand and vigorous sales efforts, order-books were now as high as they had ever been. Profits of K. & L. Steelfounders were maintained at the same satisfactory level as the previous year, and a significant factor contributing to this was the fuller utilization of new plant installed during the past two years.

A proposal will be submitted at the annual meeting to increase the group's nominal capital by £2,000,000.

ABOUT 120 workers employed by R. B. Tennent, Limited, steel and alloy steel roll manufacturers, of Coatbridge (Lanarkshire), were paid off last Friday as a result of an overtime dispute. Disagreement started over bonus payment, and for several weeks the men in the foundry department had refused to work overtime.

Passing Thoughts . . .

IN the present state of the railways it really is a most remarkable thing that the British Transport Commission should be making plans for the carriage of coal (of all commodities) by road; and it is equally remarkable that our vast system of inland waterways, largely constructed for the transport of coal as the main cargo, should go unmentioned in their proposals. —MR. ROBERT AICKMAN, founder and vice-president, Inland Waterways Association, Limited, in a letter to the Daily Telegraph.

> *If sold by the cubic yard and not by weight at all it would make no difference to the value for money if coke were wet.—Letter in the Financial Times.*

After his union has struggled to win him [the sensible trade unionist] a measure of security in his job he does not relish becoming one of hundreds of trade unionists to be flung out of work and to have his earnings cut at a few hours' notice because a dozen men in another workshop have downed tools before getting down in an orderly way to the settlement of a dispute that has angered them.—MR. CLAUDE BARTLETT in his presidential address to the 92nd Trades Union Congress.

> *The organization of unions is antiquated, and clings to methods—and memories—which have no place in this fast-changing age. In more ways than one the writing is on the wall, and yet there is no sign that most leaders are aware of it.—Sheffield Telegraph.*

FIFTY YEARS AGO—Great discontent exists among the miners of South Wales with the wages agreement, which was signed last April and was intended to cover a period of five years. Already 33,000 have tendered notices, and several thousands are idle.—Glasgow Herald.

> *Though a man may operate a machine and even develop an affection for it, he was not made to work like a machine or to become a part of one.—Scotsman.*

The abandonment of so many restrictive practices is a matter of grave concern. . . . These practices in so many cases were expansive, helping orderly trade, and the speed, economy, and volume of production for home and oversea markets.—Letter in the Financial Times.

NCB PAY AWARD TO CLERKS

PAY increases ranging from 3s. a week for juniors to £20 a year for clerical officers have been awarded to about 35,000 clerks in the coal mining industry. The cost to the National Coal Board will be nearly £500,000 a year.

The increases operate from the first pay week this month. The new salary scale is from £3 18s. 6d. a week for a clerk, aged 15, to £950 a year for a clerical officer.

ILLUSTRATED supplement describing Government services for exporters is published in today's (September 9) issue of the Board of Trade Journal. It contains articles showing how UK traders can benefit from the assistance of the regional offices and Export Services Branch of the BOT, UK commercial representatives oversea, oversea information services, and Export Credits Guarantee Department.

BARRINGTON HOOPER C.B.E.

IT is with deep regret that we record the sudden death from coronary thrombosis last Friday of Mr. Barrington Hooper, chairman of Industrial Newspapers, Limited, the company which he created 34 years ago and to the extension and development of which he had consistently and unremittingly devoted his undoubted genius in the publicity field.

His ability found early recognition when, for the seven years up to 1914, he served on the staff of the Daily Mail under Lord Northcliffe, whose ability and concepts he always held in high regard. This early experience led him into a number of outstandingly successful achievements notably the promotion of the War Bond Tank Campaign in 1916 and the subsequent Victory Loan and the Food Economy campaigns. For these services he was made CBE in 1920.

After a brief spell of political activity, promoting the short-lived National Party, in 1924 he was appointed Controller of Publicity for the British Empire Exhibition at Wembley, whose prospects at that time had fallen to a low ebb, and there were few recollections which gave him greater pleasure than the outstanding and world-wide success which was ultimately attained for that event.

In 1926 he formed Industrial Newspapers, Limited, in association with, among others, Mr. Harold Jeans, who later became chairman of the company with Mr. Hooper as managing director. The association continued until 1955 when, on the retirement of Mr. Jeans, Mr. Hooper also took over the chairmanship. At the time of the company's foundation its publications, though of high repute, were relatively few, but the number grew steadily and the new approach and vigorous policy brought to bear on their publication launched a new epoch in trade and technical journalism.

Mr. Hooper, who was 75, was a man of wide interests, largely concerned with the technical and industrial fields covered by the journals he published. He had almost the unique distinction of having served as a member of Council of the Advertising Association since the foundation of that body, and he enjoyed a wide circle of friendship in political and publicity circles through his membership of the Thirty Club and the Constitutional Club, of which latter he was managing trustee.

Mr. Hooper died in harness—that is how he would have wished it to be. He worked hard, but would never admit to being a hard worker. The truth is that he enjoyed every minute of the working day. He would never have retired. To be idle was anathema to him. Not long before his death he spent three weeks in hospital and hated every minute of it.

He suffered a heart attack on his return from the Southport conference of the National Association of Colliery Managers in June, and accepted the warning of his medical advisers—hence the three weeks in hospital. Having undergone the enforced rest, he was soon back at his desk, as cheerful and as ebullient as ever, and the day before he died he was enthusiastically discussing the arrangements for the 1961 conference of the NACM.

Barrington Hooper was a kindly man; but he would reply brusquely to an inquiry as to his health. He ignored minor ailments which would have incapacitated other people for days; more serious complaints he bore stoically but impatiently as an unwarranted and unwanted interruption to routine. This intolerance of ill-

ness extended only to himself; he was a fount of sympathy, encouragement, and support where others were concerned.

Mr. Hooper worked hard on behalf of the National Association of Colliery Managers and his services were acknowledged many years ago by his being elected by the General Council an honorary member of the association. But it was in the post-nationalization years that the association drew most generously on his help and advice. His idea it was to hold a full-scale annual conference of colliery managers and he it was who organized the first such conference at Cardiff in 1949.

Thereafter successive NACM presidents sought the benefit of his vast experience and great organizational abilities. His help was readily forthcoming. He never sought to force his opinions on technical matters. He would offer suggestions on timing or subject matter, but the technical sessions were the president's responsibility and outside his sphere.

Where his services were invaluable was in organizing the all-important background to the conferences, selecting the venue, making banqueting arrangements, and generally supervising the social side of these annual meetings. In the last few years registrations at the NACM conferences have generally topped the 700 mark. With these large attendances to make a success of a three-day conference involving two full-scale banquets, a series of luncheons, and numerous outside events calls for qualities of organization, personality, persuasion, and tact which Barrington Hooper possessed above all else. In NACM circles he will be sadly missed.

His special organizational abilities had benefited other institutions and societies also. Among the many may be mentioned particularly the Institute of British Foundrymen of which Mr. Hooper had been an elected member of the General Council and a member of the Finance Committee since 1939. For two years (1939 to 1941) he served as president of the London branch of the IBF and he was a member of the committee responsible for the Foundry Exhibition in Birmingham last year.

He was also a member of the Midland Institute of Engineers and the Iron and Steel Institute, attending many of the institute's foreign meetings.

Barrington Hooper was a great mixer. He liked people and liked meeting people—and they liked him. He was more than a great personality; he was a man of great personal charm. It could be written of him as the poet wrote of Abou ben Adhem that he "loved his fellow men." That might well be his epitaph.

The cremation was private. A memorial service for Mr. Barrington Hooper will be held at St. Bride's Church, Fleet Street, London, E.C.4, at 12.30 p.m. on September 20.

New Master Cutler Nominated

SHEFFIELD's 337th Master Cutler, to be installed at the Cutlers' Hall on October 4, is Mr. Charles Henry Trelease Williams, chairman of the Park Gate Iron & Steel Company, Limited. He comes from a family of iron and steel men, and has been accorded the highest honour of the Cutlers' Company 48 years after he entered the industry as an electrical apprentice with Park Gate Iron & Steel.

Mr. Williams is managing director of the Renishaw Iron Company, Limited, and a director of the Byfield Ironstone Company, Limited, Round Oak Steel Works, Limited, and of Tube Investments, Limited, whose board he joined in August of this year. Since 1952 he has been chairman of the British Iron and Steel Federation training committee and he is a member of the federation council and executive committee.

Following Mr. Williams' formal election on Friday last, the following officers were elected: Senior Warden, Mr. Gerard Young, chairman and managing director of the Tempered Spring Company, Limited; Junior Warden, Mr. Stephen Martin de Bartolomé, chairman of Spear & Jackson, Limited; Searchers, Sir Stuart Goodwin, Col. Edgar William Wilkinson, Mr. Antony Barmore Hampton, Mr. Howard Poulston Forder, Mr. Eric Mensforth, and the Hon. Mark Robin Balfour.

Recent Wills

HAMILTON, JOHN, former colliery director, of Bredbury (Ches) £9,080

KENDRICK, FREDERICK, works manager and a director of Sheffield Forge & Rolling Mills Company, Limited £7,100

TURNER, REGINALD, founder and head of Turner Automatic Machinery Company, Limited, engineers, of Bradford £36,972

LEWIS, GROUP CAPT. E. C., a director of Hick, Hargreaves & Company, Limited, engineers, iron-founders, and millwrights, of Bolton (Lancs) £100,965

PROBERT, EDWARD, a former director and secretary of E. Probert & Sons, Limited, wholesale coal merchants, of Bilston (Staffs), and house coal officer for Bilston district £6,776

MONCUR, R. A., former agent at Haunchwood Colliery (Warwickshire), and from 1948 until his death manager at Silverhill Colliery, East Midlands Division of the National Coal Board ... £12,294

FINDLAY, JOHN, chairman of the Premier Lamp & Engineering Company, Limited, Leeds, managing director of Barnes & Bell, Limited, Glasgow, iron, steel, and machinery merchants, and chairman of the Steel Stockholders' Association £46,570

INTESTATE

HASSNIP, C. S., a director of Walter Woodthorpe, Limited, coal and coke factors, bunkering contractors, and shipbrokers, of Boston Dock (Lincs) £5,084

PARKER, SIDNEY, former colliery manager of Thurcroft, near Rotherham (Yorks) £2,560

BELFAST shipbuilders and engineers, Harland & Wolff, Limited, is to pay off about 300 men between this week and the end of October. The company told union representatives that further redundancies were likely to occur between October and the spring of 1961, and the position after that would depend on whether orders for new tonnage were forthcoming. The company stressed that everything possible was being done to attract new work to the port, against a background of a limited demand for new tonnage. The 300 men to leave by October are shipwrights, caulkers, welders, and platers.

New Yorkshire Pit

KELLINGLEY COLLIERY TO COST £10,000,000

INITIAL levelling of the site for the new Kellingley Colliery, in Yorkshire, which Mr. Richard Wood, the Minister of Power, visited last week (IRON AND COAL, September 2, 1960, p. 494a), began in November, 1957, and the shafts were set out on January 1, 1958. When in full production (October, 1964, or thereabouts) the colliery will produce about 6,000 tons of saleable coal per day. At least 50 per cent. of the output will be power-loaded.

The Kellingley project is in the No. 8 (Castleford) Area of the North-Eastern Division of the National Coal Board, the new colliery being situated on the south side of the Knottingley to Goole main road approximately one mile east of Knottingley. The mineral "take" is square in shape, 4 miles by 4 miles. The workable reserves are estimated at 201,300,000 tons, and the proposed annual saleable output is 1,476,000 tons, giving a useful life of approximately 130 years. When in full production the colliery will provide employment for 3,000 men.

For the first 50 years the output will be extracted from the Silkstone and Beeston seams, which lie at depths of 2,087 ft. and 2,298 ft., respectively.

Boreholes proved the existence of some 600 ft. of water-bearing strata above the coal measures, and it was decided to employ the freezing process for the first 640 ft. of the sinking at both shafts. The techniques employed were described by Mr. D. Maishman in a paper given to the Yorkshire Branch of the National Association of Colliery Managers last year (IRON AND COAL, October 30, 1959, p. 707).

Freezing commenced at No. 1 shaft on October 27, 1958, and the ice wall formed by May 5, 1959. Freezing at No. 2 shaft commenced on December 15, 1958, and the ice wall formed by July 9, 1959. The ice walls are approximately 80 ft. in diameter. Refrigeration is maintained throughout the whole period of sinking through the water-bearing strata. When the shafts have been sunk to the base of the frozen ground, the ground will be thawed out by circulating hot brine through the pipes.

The main sinking at No. 1 shaft commenced on February 26, 1960, and at 6 a.m. on August 25 excavation was down to 719 ft. The main sinking at No. 2 shaft commenced on June 20 of this year and excavation was down to 359 ft. at August 25. It is expected that No. 1 shaft will be down to the bottom by the end of April, 1961, and No. 2 shaft by the end of July, 1961.

Each shaft is served by two tower-mounted, four-rope, friction winders. The towers are of steel construction, the one at No. 1 shaft being 142 ft. high and the No. 2 tower 157 ft. high. The winders are driven through reduction gear by 1,100-h.p. alternating current motors. The permanent winders are being used for sinking, employing two hoppits per shaft, the winder drums having been modified to accommodate single-rope winding. After shaft sinking has been completed, the winders will be fitted with closed loop control, an electrical device to enable the winders to be operated by remote control from the banksman's level.

For the sinking, three four-drum sinking scaffold winches are housed in each permanent heapstead structure. By using permanent structures for the initial work, time and money will be saved.

The output will be wound from the Silkstone and Beeston seams at the No. 2 (upcast) shaft in 15-ton capacity skips. This shaft will be equipped with two skips and counterweights, an arrangement which gives flexibility, inasmuch as coal may be wound from either seam level with either skip.

The No. 1 (downcast) shaft will be equipped with two three-deck cages and counterweights, again providing flexibility; it will be used for winding men, materials, and dirt.

Underground, the coal will be transported by face conveyers, discharged on to gate conveyors, which in turn will transfer the coal to trunk conveyors, thence to central loading stations, where it will be loaded into 5-ton capacity mine cars. The cars will be hauled by 100-h.p. diesel locomotives to a tippler in the pit bottom and from there conveyed to the skip loading pockets. The men will be transported to and from their work in special carriages.

On the surface, coal will be discharged from the skips and conveyed by belt to a 600-ton/hr. coal preparation plant. Pit and washery dirt will be transported to disused limestone quarries near Knottingley which have approximately 10 years' tipping life at 1,000 tons per day. Subsequently, the dirt will be used to reclaim marshland south of the colliery site.

Pithead baths facilities will be provided for 3,000 men, who will travel between the man-riding shaft and the baths along heated covered gantries. Other facilities include a canteen, a medical centre, and a car and bus park.

With the exception of the heating plant, the colliery will be completely electrified, power being taken from the Central Electricity Generating Board. Three coal-fired boilers will provide heating and hot water for the whole of the surface buildings.

The estimated total cost of the colliery is £9,899,080. Expenditure to date is £2,438,605.

EXCLUSIVE CONCESSIONS in the UK have been granted to K.W. Chemicals, Limited, London, W.C.1, as stockists and grinders of sulphur produced by Société Nationale des Pétroles d'Aquitaine, of Laq, France. K.W. Chemicals has concluded partnership agreements for these concessions with William Blythe & Company, Limited, Accrington. The French company has built the world's largest sulphur plant at Laq with an estimated output in 1961 of 1,400,000 tons of sulphur a year.

Personal

Sir Leslie Gamage's Farewell to GEC

SIR LESLIE GAMAGE

AT its annual meeting last week, the General Electric Company, Limited, took farewell of Sir Leslie Gamage, who retires at the end of this year. He has relinquished his executive duties as managing director and vacates the chair on December 31.

Mr. A. L. G. Lindley, vice-chairman, paid tribute to Sir Leslie's lifetime of service with the company, which he joined in 1919. Sir Leslie, he said, was known all over the world, not only because of his travels oversea, but because of his untiring efforts and devotion to the company. Sir Leslie, responding, said that although he had been chairman for only three years, he believed that in that time they had put the company on to a sounder basis. He looked forward to others following on making it one of the most prosperous companies in the world.

On the invitation of the British Coal Utilization Research Council, Dr. F. J. DENT is to give the ninth Coal Science lecture at the Institution of Civil Engineers on October 12.

The Minister of Power has appointed Mr. D. J. EZRA, director-general of marketing of the National Coal Board, to be a member of the Industrial and Domestic Coal Consumers' Councils.

Leaving for Moscow today (Friday) is Mr. GEORGE FREDERICK HART, a Sheffield geologist. One of 20 students making the trip to the USSR, Mr. Hart will study the analysis of Russian coal seam samples.

After more than 50 years in the coal industry, Mr. JOHN S. MCCALLUM, a civil engineer with the National Coal Board at Cowdenbeath, has retired. Before nationalization he served with the Fife Coal Company, Limited.

Council of British Manufacturers of Petroleum Equipment has invited Sir JOHN WRIGHTSON, chairman of Head Wrightson & Company, Limited, to be its principal guest and speaker at the annual dinner on October 5.

Corrosion and Metal Finishing Exhibition, which is to be held at the Empire Hall, Olympia, from November 29 to December 2, will be opened by Sir ALEXANDER FLECK, FRS, president of the Society of Chemical Industry.

Mr. WILLIAM C. YOUNG, group manager of Polquhairn-Littlemill collieries (Ayrshire) has retired after 52 years in the mining industry. He started work as a miner in 1908, and in 1923 became a deputy. Three years later he was made overman and in 1929 manager of Glenburn Colliery, a position he held for 20 years.

One of 10 British welding experts invited to join a technical mission to the USSR is Mr. W. C. HOLLIDAY, head of the welding department at Whessoe, Limited, Darlington. The party, composed of representatives of the Institute of Welding and the British Welding Research Association, will be in Russia for two or three weeks.

Council of the Institute of Export has elected as its chairman Mr. D. E. GRAHAM, managing director of James Archdale & Company, Limited, machine-tool makers, of Birmingham, a subsidiary of the Staveley Iron & Coal Company, Limited. Mr. Graham joined the Staveley Iron & Coal group last year, after 20 years with Crompton Parkinson, Limited.

After 19 years with the Richardsons, Westgarth & Company, Limited, group of companies, Mr. FREDERICK W. MATTHEWS has retired. He joined the group in 1941 as commercial manager, later becoming group purchasing manager. In 1953 he joined the board of the subsidiary, North Eastern Marine Engineering Company, Limited, now George Clark (Sunderland), Limited.

Mr. JOHN CRESSWELL, mines manager of Stewarts and Lloyds Minerals, Limited, has retired after 51 years in the ore mining industry. He began his career on leaving school as an office boy with the Islip Iron Company, Limited, and subsequently opened up and managed various quarries in the area. In 1948 he was appointed outside assistant to the mines manager of Stewarts and Lloyds Minerals, and in 1950 he became a group manager. The following year he became assistant mines manager and in 1954 he took up his last position. Mr. Cresswell was also chairman of the company's consultative and advisory committee and its representative on the Northamptonshire and District Mine Owners' Association.

New President of the Institution of Mining and Metallurgy

PRESIDENT of the Institution of Mining and Metallurgy for 1961-62 is to be Mr. A. R. O. Williams, a managing director of Consolidated Gold Fields of South Africa, Limited, and of New Consolidated Gold Fields, Limited. He will succeed Prof. David Williams in May of next year.

Educated at Malvern and trained in metallurgy at the Royal School of Mines from 1922 to 1926, Mr. Williams, after a brief period with Riley, Harbord & Law, Limited, went to South Africa to begin his long association with New Consolidated Gold Fields.

Apart from the Gold Fields group he is a director of G.F.K. Refractories, Limited, Lake View & Star, Limited, Tangold Mining Company, Limited, and the South West Africa Company, Limited.

Mr. Williams, who was elected a member of the Institution of Mining and Metallurgy in 1944, became a member of the council two years later and from 1951 to 1954 was vice-president. In 1957-58 he was chairman of the United Kingdom Metal Mining Association and he is a corresponding member of the council of the South African Institute of Mining and Metallurgy which he represents on the Commonwealth Council of Mining and Metallurgical Institutions.

COAL SHIPMENTS from the River Wear last week amounted to 12,000 tons—the highest figure since the seamen's strike started, but less than a quarter of the normal weekly average. Over 40,000 tons of coal were delayed in 12 colliers on the Wear last week, while at Blyth 17 ships were involved.

Science and Technology

GROWING IMPORTANCE IN INDUSTRY

"I HAVE no sympathy with those who regard technology as intellectually a poor relation of science. To me science without technology is incomplete and inconclusive," said Sir George Thomson in his presidential address at the annual meeting of the British Association for the Advancement of Science, at Cardiff. Throughout his address Sir George stressed the interdependence of pure science and technology. The best way to make advances in technology turned out to be an understanding of the principles. That was a quite recent discovery and it had probably only recently become true.

"The dependence of technology on pure science is now pretty generally recognized by industry," he said. "The more progressive industries maintain research laboratories which both make use of the basic discoveries made in the universities and elsewhere and contribute their own. There are black spots, of course; industries which spend too little on research or organize it badly, but broadly speaking the need is realized and reasonably well met."

Systems of philosophy came and went, Sir George added. But when conclusions deduced from precise experiments by mathematical theory led to detailed predictions from which working machines could be designed, machines which, without the theory no one would have thought of in a million years, then indeed one knew that one lived in a universe that was rational and that a key to one of its rooms had been found.

Task of Adaptation

Dr. James Taylor, a director of Imperial Chemical Industries, Limited, in his presidential address to the chemistry section stressed the growth of scientifically based industries—a notable feature of the present century. We might deplore the fact that we lived in an international jungle, he said, but our first necessity was to survive in it. Competition today assumed unusual and sophisticated forms and industry provided the means of carrying out the struggle and its tools and techniques were increasingly scientific.

Dealing with advances in science and technology, Dr. Taylor said that the mere utilization of energy did not itself provide the conditions for unlimited leisure because people became machine-minders and clerks and physical drudgery was replaced by mental drudgery. Universities were now confronted with the task of adapting themselves to technology, and industry was in the process of adapting itself to the university-trained scientist and the orderly thinking of academic disciplines.

Students in science were trained by school and university teachers who for the most part had no personal experience in industry—or for that matter outside their own specialized sphere. It was not surprising that the graduate, relatively mature by the time he obtained industrial employment, found the process of adaptation both difficult and perplexing.

Plans by the Soviet Union to produce 50 times as much electricity in 1980 as she did at the end of the war were reported to the engineering section by a leading Soviet scientist, Prof. V. Venikov. Russia, whose production in 1945 was about the same as Britain's, aimed at an output of 2,000,000,000 to 2,300,000,000 mW-hours in 1980.

A few 400-mW atomic power stations had been built and a few more were proposed, the stations being regarded purely as industrial experiments and not really for use. Production of ordinary fuels such as coal and oil was expanding so fast that the need for atomic energy was not so pressing.

For the information of those attending the annual meeting the National Coal Board is screening three films. "British Wealth from Coal" is an account of the geological history of coal in Britain and the technological problems of coal production. Originally designed for presentation in schools, the film is an up-to-date version of three previous NCB productions—"The Origin of Coal," "Winning the Coal," and "Using the Coal."

"The Mawco Coal Cutter Loader" is a typical example of the NCB training film and was chosen for the Cardiff meeting partly because of the importance of mining in South Wales and partly because it provides an illustration of the technological revolution taking place in the industry.

The third film, "Bubble Behaviour in Froth Flotations," is a research film made by Coal Board scientists to illustrate their experiments in coal cleaning and conveying techniques.

Financial Reward "Chief Incentive" in Industry

FINANCIAL reward was listed as the chief incentive towards good labour relations in industry by Mr. R. Haslam, director, Nobel division, Imperial Chemical Industries, Limited, in an address to the summer school in management studies at St. Andrew's University, Edinburgh, last weekend. Second in his list of incentives was good working conditions, and third was security.

Mr. Haslam added that it was essential to provide chances of promotion, especially on the staff side. It was equally important to have some method of assessing faults and letting a man know that the company thought of him.

Dr. N. E. Loveless, lecturer in psychology, stressed the importance of "fitting the job to the worker, instead of fitting the worker to the job." There had been a tendency in the past to build a machine first and to get the man to cope. Research into the limitations of the human operator, however, had led to the designing of machines in the light of what had been learned.

Appointments

NCB Sales Manager for London and South

APPOINTMENT is announced by the National Coal Board of Mr. R. ELLIOTT as manager of its London & Southern Regional sales office at Derbyshire House, London. He succeeds Mr. Derek Ezra, who has become the board's director-general of marketing. Mr. Elliott was educated at Wrekin College, and in 1932 went into business as a coal merchant in Pontefract (Yorks), holding the agency for the Prince of Wales Colliery. He joined the Bolsover Colliery Company, Limited, in 1935 as assistant London representative and later became Eastern counties representative.

During the war he served with the Royal Army Service Corps attaining the rank of Major. He returned to the Bolsover Colliery Company in 1946 and joined the marketing department of the NCB at Derbyshire House in 1947 as a representative for the East-Midlands Division. In 1953, when regional selling was introduced, he was made head of the house coal section. In 1957, he moved to Hobart House as deputy manager of the inland branch, marketing department. He returned to Derbyshire House as deputy manager of the London & Southern sales office in June, 1958.

Dr. JOHN D. KENDALL has been appointed director of the European research laboratories of the Minnesota Mining & Manufacturing Company.

Mr. F. PARKER has been appointed export sales manager of Bray Construction Equipment, Limited, manufacturers of hydraulic loading shovels, Feltham (Middx).

Mr. V. J. BRYANT, formerly technical assistant to the managing director of the La Pointe Machine Tool Company, Limited, has been appointed technical director.

West Drayton (Middx) firm of construction equipment suppliers, J. I. Case Company, Limited, has appointed Mr. EDWARD T. GREEN as industrial sales manager, concentrating on the coal, electricity, gas, and chemical industries in the British market.

Mr. W. MUIR has been appointed London manager of Bray Construction Equipment, Limited, Feltham (Middx). He was previously with the Caterpillar Tractor Company, Limited, as a parts promotion manager and latterly as manager, London office.

Mr. A. CHILTON has been appointed under-manager of Lea Hall Colliery, in the Cannock Chase Area of the West Midlands Divisional Coal Board. He has been under-manager at Hawkins Colliery since 1949, before which he had gained experience at various Cannock Chase collieries.

Cmdr. E. G. SUTTON, R.N. (Rtd.) has been appointed works director of Sir W. H. Bailey & Company, Limited, pump and valve manufacturers, of Patricroft (Lancs). He will be responsible for the production of the company's whole range of pressure regulators, sluice valves, pumps, and turnstiles.

Mr. JAMES HARROLD has been appointed assistant service manager of William Doxford & Sons (Engineers), Limited, engineers and shipbuilders, of Sunderland. He joined the company on leaving school, and after his apprenticeship and service in the drawing office became responsible for all engine testing.

Mr. W. B. WHITWORTH has been appointed sales manager of the alloys division of Union Carbide, Limited. Formerly a regular Naval officer, Mr. Whitworth joined Vickers-Armstrongs, Limited, after the war, later becoming naval manager of the Sperry Gyroscope Company, Limited. He joined Union Carbide in February of this year.

Mr. F. HORACE GEE has been appointed fuel supplies officer, chief supplies officer's department, British Transport Commission Headquarters. He began his career at the LNW Railway, in the coal office of the chief mechanical engineer at Crewe, and, on amalgamation, was transferred to the LMS motive power superintendent's coal office at Derby for supply and distribution. In 1932 he went to Euston and was later promoted assistant head of section (fuel), Railway Executive. During the war he was secretary of the LMS Fuel Efficiency Committee. He became acting head of section (fuel), Railway Executive, later British Transport Commission in 1953, and two years later assistant fuel supplies officer.

New Area Engineers in NCB's Durham Division

CHIEF engineer of the No. 4 Area of the Durham Divisional Coal Board, Mr. J. N. L. Woodley, has been appointed chief engineer of the No. 2 Area in succession to Mr. W. L. Tulip. Mr. Woodley is 37 and a graduate of Durham University. From 1943 to 1951 he served in the No. 2 Area and was then appointed assistant to the chief engineer of the Northern (N&C) Divisional Coal Board. He returned to Durham in 1957.

Mr. G. A. ROSS, at present electrical engineer of the No. 6 Area of the Division, is to succeed Mr. Woodley as chief engineer of the No. 4 Area. He is 38 and before taking up his post in the No. 6 Area in 1957 had held appointments with the North-Western and Northern (N&C) Divisional Coal Boards.

Mr. Tulip, whose retirement has led to the new appointments, has spent more than 40 years in the mining industry. He served from 1919 to 1947 with Lambton, Hetton & Joicey Collieries, Limited, from 1934 as its chief mechanical engineer. He has been chief engineer of the No. 2 Area since 1947.

Natural Gas from the Sahara for Europe?

FRENCH experts are satisfied that they have solved the technical problems of laying a natural gas pipeline on the Mediterranean seabed to bring Sahara gas to European markets. This was announced by the Minister for Industry, M. Jeanneney, on his return from Algeria where he watched tests in progress.

The pipeline would run from Mostaganem to Cartagena and would be joined to the network of natural gas pipelines radiating from Laq. The submarine pipe would be nearly 500 miles long and 8 in. in diameter and its greatest depth would be just under 9,000 ft. In Algeria, about two-thirds of the pipeline linking the gas source at Hassi r'Mel to the coast have been laid.

A new company, called Semarel, has been established to market the gas in Europe. It is owned by the French State company Gaz de France, and the two oil companies—Repal and C.F.P. (Algeria)—which control Hassi r'Mel.

Can Coal Keep Pace?

NO CHANGE IN FALLING MANPOWER FIGURES

OUTPUT of deep-mined coal last week at 3,536,600 tons is within 7,000 tons of the average weekly output for the year so far. Open-cast output, however, at 134,500 tons is well below the average of 152,500 tons indicating the extent to which this source of supply is dropping off. The winter situation and how successfully deep-mined output is able to keep pace with the demand will probably be important factors in consideration given by the National Coal Board to the pursuance of its present policy of reducing the output of profitable open-cast coal to a bare minimum.

The manpower situation is reflected in the totals for the 34 weeks ended August 27. The total number of men employed now averages 610,400, a drop of 8.5 per cent. on the comparable period last year. The average number of faceworkers has dropped from 259,700 to 233,500—no less than 10 per cent. and the downward trend shows no sign as yet of being arrested.

Output per manshift, however, continues its post-holiday climb back to the region of 80 cwt. At 78.38 cwt. it is just below the 78.92 cwt. average for the year to date.

Enough in Stock?

Whether or not sufficient stocks are held by industry, the public services, and merchants remains to be seen. Colliery holidays and transport bottlenecks have probably contributed to the present situation where distributed stocks at 13,296,000 tons are slightly down on the previous week.

There were 591,600 wage-earners on colliery books on August 27, against 651,500 on August 29, 1959, the numbers engaged at the coal face being 225,300 and 253,400 respectively. Total absenteeism (all workers) in the week ended August 27 was 13.95 per cent. compared with 13.92 per cent. in the week ended August 29, 1959. Output at the face was 3.919 tons and overall 1.377 in the week ended August 27, compared with 3.605 and 1.307 tons in the week ended August 29.

The following table gives (in tons) the output of saleable mined coal by division in the week ended September 3, and the tonnage lost through all causes (holidays, disputes, and go-slows):—

Division.	Week ended September 3, 1960.		Week ended September 5, 1959.
	Total output.	Tonnage lost.	Total output.
Scottish	353,800	3,300	378,600
Northern (N&C) ..	243,700	100	260,500
Durham	452,100	—	447,700
North-Eastern ..	753,600	15,300	793,400
North-Western ..	257,600	1,500	280,600
East Midlands ..	780,300	87,400	828,800
West Midlands ..	262,800	7,200	298,100
South-Western ..	363,300	13,600	408,100
South-Eastern ..	28,300	100	32,200
Great Britain—			
Deep-mined coal ..	3,495,500	128,500	3,728,000
Other deep-mined (including licensed mines) ..	41,100	—	57,700
Open-cast coal ..	134,500	—	222,300
TOTAL	3,671,100	128,500	4,008,000

Durham Coke-oven Workers End Strike

TWO thousand men employed in eight National Coal Board coke plants in Durham returned to work on Wednesday after being on unofficial strike for more than a week. The men stopped work for more pay, and the decision to return was made so that wage negotiations could continue.

The return to work followed a meeting on Monday between the strikers' representatives and Mr. Will Paynter, general secretary of the National Union of Mineworkers, and Mr. T. Tindale, secretary of the cokemen's section, who had flown from the Isle of Man in an effort to settle the dispute. The delegates were told by Mr. Paynter and Mr. Tindale of the terms of a national settlement with the NCB approved by the national executive at a meeting in the Isle of Man on Saturday. Under the agreement, cokemen would get an immediate increase of 9s. 5d. a week, with another 4s. 5d. within six months to put them on the same level as colliery surface workers.

The Durham Divisional Coal Board in Newcastle last Friday denied an allegation by the Durham Coke workers that the rate of production at those coking plants affected by the strike was higher than that required for the safety of the plants. A statement said that the plants were being manned by volunteers in order to keep them in a safe condition so that full-time working could be resumed as soon as possible when the strike was over.

NCB Students' Exam Successes

OF 15 National Coal Board employees who sat for the Final Grade Boilerhouse Examination set by the City and Guilds Institute in May, 10 passed. In the intermediate grade, 40 board students were successful out of the 49 who took the examination. Divisions with the highest percentage of first-class passes in the latter grade were the North-Eastern and the South-Western.

In this year's Combustion Engineering Examination, also held in May, 10 of the 15 students entered by the Coal Board were successful. Students, says the NCB, train at home on a correspondence course arranged through the College of Fuel Technology, and meet in groups once a month to revise and do practical work under a trained engineer.

In the examination for the Boiler Operator's Certificate 89 were successful.

New Chief Engineer at SCOW's Trostre Works

MR. G. E. TURPIN has been appointed chief engineer at the tinplate division, Trostre, of the Steel Company of Wales, Limited. Educated at Erith Technical College, where he gained his AMICE, he served an engineering apprenticeship with Vickers, Limited, and in 1922 joined Richard Thomas, Limited, as an assistant to the consulting engineer. After holding various posts, he was appointed civil engineer during the construction of Trostre works, and at the start of operations became chief mechanical engineer.

Chief electrical engineer at Trostre, Mr. E. H. Vaughan, has been appointed deputy chief engineer. After studying engineering at University College, Swansea, he served his articles with Metropolitan-Vickers, Limited, and became assistant engineer in the general engineering department. In 1947 he was appointed lecturer in engineering at Llanelly Technical College, and after a period of work on the construction of SCOW's Abbey and Trostre Works, returned to the college as head of the engineering department.

New appointments in the steel division of SCOW are: Mr. G. L. Dennis, from labour relations officer, general, to personnel officer; Mr. G. B. Hughes, from senior rollerman to manager, hot strip mill; and Mr. R. H. Slade, from assistant manager to manager, slabbing mill.

"Scruffy" Little Works the Happiest?

"THERE are thousands of scruffy little factories where 10 men work together far more happily than if they were all herded together in a slap-up place with all modern conveniences attached." Apprentices at the eleventh annual conference organized for them by the Industrial Welfare Society were told this on Sunday by Mr. Peter Runge, managing director of Tate & Lyle, Limited. He believed that it was an impossible task to make the card index and the works handbook do the job of the personal contact and word-of-mouth instruction.

Attention was being directed, Mr. Runge said, towards developing techniques of management which would produce in large concerns the happy atmosphere of the smaller unit. "I would rather see the attention directed towards the small unit," he said. Mr. Runge also criticized the use of computers for office routine. "Office routine is inhuman enough already," he declared, "so we had better be on our guard when it gets into the hands of moronic computers lest we are brought unwittingly one stage nearer the ant."

Board of Trade to Sell Zinc

ABOUT 1,600 tons of zinc, for delivery and pricing between October, 1960, and March, 1961, are offered for sale by tender by the Board of Trade. About 1,000 tons consists of special high grade and 600 tons of high grade metal.

Tender forms can be obtained from the Board of Trade, E.I.D. (4) Division, Lacon House, Theobalds Road, London.

£11,000,000 Strip Mill for Algoma Steel

NEW steel mill to cost $30,000,000 (about £11,000,000) is planned by Algoma Steel Corporation, Limited, of Canada. An order has been placed with the Dominion Engineering Company, Limited, Montreal, for a six-stand wide strip mill which will be an extension to Algoma's present bloom and plate mill.

The new mill will produce hot rolled sheets and light plates to a maximum width of 96 in. It is described as the largest rolling mill of its type to be made in Canada. The project will be financed internally, and the mill will require several years to construct. It is estimated new expansion will require an additional 400 men when operating in 1963.

In recent years Algoma Steel has been building increasing facilities to further manufacture and shape its basic steel output. Currently the company has under construction, scheduled for completion next spring, a $15,000,000 (about £5,500,000) beam mill to produce wide flange beams up to a maximum of 24 in., a product not now made in Canada.

Elliott-Automation Link with US Valve Manufacturers

MANUFACTURE and sale of certain valves, notably the P-K Paul Valve, is to be undertaken by Elliott Bros. (London), Limited, a member of the Elliott-Automation, Limited, group, under licence from General Kinetics Corporation, of New Jersey, US. The licence covers only areas in the Eastern hemisphere. At the same time, General Kinetics has entered into a separate agreement with Elliott which gives the US company exclusive rights of distribution and servicing of certain of Elliott's equipment throughout the Western hemisphere.

The main bulk of equipment from the Elliott group will come from James Gordon Valves, Limited, and the group's comparatively new acquisition, Black Automatic Controls, Limited. The main reason for the arrangement is to give Black Automatic an outlet to the US market. The company manufactures a variety of control valves and pressure regulating equipment.

IRONFOUNDERS' ASSOCIATION PENSION DECISION

AT its quarterly meeting in Dudley (Worcs) last week, the National and Midland Ironfounders' Association agreed that because of differences from firm to firm, member companies should decide individually whether to contract in or out of the Government graduated pension scheme, which comes into operation next April.

Reduced scale of subscription for membership of the association will apply in future, it is stated. This will be: for the first 1,000 tons per annum, 4d. per ton; for the second 1,000 tons per annum, 3d. per ton; and tonnage in excess of 2,000 tons at 2d. per ton. Many members will shortly be receiving a refund on part of their present year's subscription.

The effect of social changes and the advent of new techniques on management since the mining industry was nationalized are reviewed by Mr. W. Davison, production manager, No. 2 Area, Northern (N & C) Divisional Coal Board, in his presidential address to the North of England Branch of the National Association of Colliery Managers on July 6, 1960. He outlines action to be taken by colliery management to improve the marketing of coal in the face of competition from oil.

COLLIERY MANAGEMENT

Today and Tomorrow

PRESIDENTIAL ADDRESS TO NORTH OF ENGLAND NACM

By W. DAVISON

CHANGE in industrial control has taken place from that exercized by the owner to a control by salaried managers. What does this mean and how does it alter the authority and responsibility of management in general and colliery managers in particular? The growing cost and complexity of industrial processes has led to the need for capital requirements and technical knowledge far beyond the capacity of individual owners, with the result that units have grown and have been amalgamated by nationalization, take-over bids, and consortia.

Apart from the nationalized industries, which are public corporations responsible through Parliament, ownership of these undertakings is in the hands of investors who have neither the financial expertise nor the scientific and engineering training to exercise influence on policy decision, which must be left to those with special training and experience—salaried officials, managers.

The growth of authority brought about by this development is apparent; the responsibility to professional conscience and to the public, who are the shareholders, must ever be in the minds of those who form this new society. As the processes of social change are reducing the old order of privilege, those of industrial advancement are elevating the managerial class. The industry with which we are associated is nationalized, a circumstance which casts an additional burden upon us because, contrary to the case of private enterprise, our directors are salaried officials appointed for their special knowledge of some functional aspect of our work, and are themselves members of the managerial society.

If the responsibility of the members of the National Association of Colliery Managers has changed and grown as a result of social changes, it has also developed at least as much with the advent of new techniques. This change from the earliest methods of hand hewing, pony putting, and rope haulage systems has created a considerable impact in management technique; even so, it is overshadowed by the current revolution in the application of power-loading methods which daily gains momentum.

The national proportion of output obtained by power-loading methods has now reached 35.9 per cent. and it requires little courage to prophesy that within the course of the next few years the major part of our output will be obtained by constantly improving machines or combinations of machines.

It is recognized that this process will and must continue with ever-increasing tempo if the industry, particularly in the seams of impoverished quality available in this northern coalfield, is to survive in competition with other sources of fuel and atomic energy. It is of special concern in the northern coalfields that we must achieve the highest productivity to offset the less favourable quality in the common markets.

The paramount need today is to achieve the high productivity made possible by concentration and mechanization. The tools and equipment to do the job are available and must be applied to the limit.

This does not in any way mean mechanization for mechanization sake. The object at all times must be to adopt mechanization with an assurance that the required result will be obtained and it is in this respect that the skill and knowledge of the mining engineer is more than ever before essential.

In the field of mechanization there is a wide choice of machines to suit a particular condition and a great deal of information is available on the performance of all types. It is a question for careful consideration to apply the machine most suited to the conditions.

The Anderton disc shearer has in the years shown a great increase, from its introduction in 1953 and following the Mechanization Conference

in 1955, the number of machines has increased from a few installations in 1955 to 320 in 1959 in the short period of four years. Because of the needs of large-coal production the machine has now been modified in various ways.

Any reference to mechanization at the face would not be complete without special mention of the introduction of self-advancing hydraulic supports, which have now come to be regarded as an indispensable aid to rapid advance with narrow-web machines. This new technique in roof support and control is without doubt the most revolutionary contribution to production and safety. The control of the roof, the movement of the supports and the drawing of the waste has now become a highly skilled operation, providing greater efficiency and protection to the workmen. The problem of controlling strata in soft floor conditions has been considerably eased by reason of the greater bearing surface offered by the chocks.

Apart from mechanization at the face, there is still the very great field of operations back from the face, to the shaft, and finally, to the coal wagon. This subject is also well known, but it is of interest to quote two paragraphs from the Reid report published as far back as 1945—15 years ago.

> "*Paragraph* 334. Another point on which loading machines have focused attention is the paramount importance of a highly efficient coal transport system. With machines capable of loading very large tonnages in a shift, a stoppage of the haulage will immediately bring getting operations to a complete standstill. Difficulties have already been encountered in getting coal away where these loaders are in use, and it would be most unfortunate if the success of the machines were prejudiced by inadequate transport.
>
> "*Paragraph* 424. In planning the layout of underground transport and the system to be employed, provision must be made for the efficient distribution of supplies, transport of machinery, and for the salvage of material. There is no doubt that in British mines today the number of men engaged upon this work is generally out of all proportion to the amount of material handled. This must be due to the fact that the planning of this work in many cases has not kept pace with changes in the nature and distribution of the supplies required."

I would seriously recommend to members of the association that if they would take out the report they would read with great interest the conclusions and recommendations contained in the report which generally have the same substance today as in 1945.

Mechanization and Management

To what extent does the impact of mechanization affect colliery management? The colliery manager today must keep abreast of the times in his knowledge of the design and potentialities of new machines and their suitability to match his mining conditions. There is no standing still in this forward advance of mechanization, designs are constantly changing and the theme of this year's national conference, "The Challenge of Change," was never so appropriate and well timed.

The maintenance of regular production calls for organization by management backed by all the aids available in the form of method study, production control, planned maintenance, and lines of communication—all controlled by a team of skilled and enthusiastic engineers under the direction of competent management.

However, colliery managers do not stand alone in the exercise of this authority and the weight of this responsibility. There is ranged behind them line management, the heads of functional departments and of branches of production department, particularly at Area level. It is the duty of these officials to help, guide and stimulate them and hold them to account. It is up to the colliery manager to seek advice and make the fullest use of the specialists in the appropriate field. No colliery manager can afford to ignore these services; indeed the pressure of day-to-day routine is such that he should welcome every opportunity to delegate work of a specialist nature, and thus profit from the knowledge and experience of fellow mining engineers who are anxious to serve rather than supplant.

On matters of policy, those persons concerned in colliery management receive directives and instructions; these are mandatory, not advisory, they are to be implemented fully and promptly. It must be accepted that the directives are no more than is required of good mining practice and good business. At the same time it is the responsibility of every official, and particularly of colliery managers, to consider carefully the application of the instructions in the context of their particular sphere of authority and to report to higher management on any circumstances which makes the carrying out of orders to be contrary to the best interests of the Coal Board and the industry; one can have no sympathy with the official who executes orders only "because he has it in writing."

Let us consider briefly some of the tasks which confront this team, a team with the colliery manager at the head—at the sharp end.

Safety

Nothing is so destructive to industrial morale as a high incidence of accidents and it is my earnest hope that the highly concentrated workings of the newly emerging mechanized mines will lend themselves to high standards of mining practice, by the exercize of close supervision and hence to safe working. I would commend to all members of the association the value of the presidential address given by Mr. H. E. Tyson at the annual conference this year. In this he not only draws attention to the need for better standards and practices but also deals with the affect of accidents on the efficiency of production as translated in terms of lost time and the dislocation of smooth working. The financial aspect of the situation is clearly emphasized both in terms of loss of earning capacity to the workmen and in the loss of production to the industry. Manpower in terms of continuous

working is still the most important factor in the mines.

Valuable work is being done by safety officers at all levels of management. There can be no doubt that these officials provide a key service to the colliery manager. It must be recognized, however, that safety officers, cannot by themselves fulfil the needs of safety. It has been and always will be the job of every person working in the mine to control their behaviour in such a way as will avoid the risk of accident. In this, management has the prime responsibility to insist on high standards of workmanship, good practices, and personal behaviour.

I would like at this point to comment upon the exceptionally close relationship which exists in these coalfields between HM Inspectorate and colliery management; it is my experience that if inspectors understand that managers are determined to conform, not only to the letter but also to the spirit of the Coal Mines Act, they will guide and help in every way. On the principle that "prevention is better than cure," managers will be well advised to seek the advice of the Inspectorate on any occasion of possible doubt.

Team Spirit

To achieve success, officials and men must understand the task to be undertaken, the plan of action which will attain the goal and the part that each must play as a team member. This connotes the subject of consultation. The machinery of consultation exists, but is it properly used? There can be no doubt that in the present evolution to mechanization and concentration of production there is a greater need than ever before for first-class teamwork. No scheme can succeed without the greatest measure of co-operation.

It is the special function of the manager to draw each man into personal involvement in the affairs of the colliery. This can only be achieved by making the fullest use of the consultative machinery, by personal contact and by example.

One needs to be something more than a technically qualified engineer to foresee, for example, what the effect of a change in a method of working is likely to be upon the workmen employed at the colliery. As managers it is our function to translate the technical advances—and the modern management techniques—into human terms, into the realities of the colliery. In short, it is a case of being managers as well as mining men, and in the successful running of a colliery, far more as managers than as mining engineers.

At the present time, particularly in the northern coalfields, we are facing a battle for survival and our main hope lies in the fullest co-operation with our marketing colleagues.

Meeting Changes in Demand

National post-war demand for coal reached its peak in 1956 when total consumption, including exports, was 228,000,000 tons. Since then there has been a fall of 33,000,000 tons in annual consumption and, because the coal industry cannot meet changes in demand overnight, we have been faced with a heavy stocking programme. This has been the prime cause of the board having to declare an overall financial loss in 1958 and 1959.

The main reasons for this reduced demand are well known—oil competition, recession in heavy industry, loss of export markets due to competition from America and Poland, and improved efficiency in the use of fuel. We have also had three relatively mild winters in succession. The board has made plans to meet the situation which affects us all.

Output has been cut back to the level of current consumption and at the same time the board is pressing ahead with plans for mechanization and concentrating output. On the marketing side, the board has stepped up its advertising, set up a technical and sales service branch, and introduced a hire-purchase scheme for solid-fuel burning appliances. In addition, and most important, coal prices have been kept stable since 1957. In this connection it is not generally appreciated that a small price increase for oil of ¼d./gal. is equivalent to an increase of about 9s. a ton for coal. To put us on to a comparative basis we should have to quote our price as so much per 10 lb. of coal.

In the immediate future there appears to be a strong demand for large coal. We must make every effort to see that no avoidable breakage takes place in getting the coal from the face to the customer. Every additional ton of large coal which we can supply improves our overall proceeds and, for the present, at any rate, there is an assured market for it. I think we must accept, however, that within a few years this demand will decrease as the railways modernization plans take effect and smokeless zones are extended.

Steel Industry's Needs

So far as the domestic market is concerned, there is an immediate need for more smokeless fuels and any delay in marketing them increases further the chances of losing ground to oil and other fuels. This is a problem which must be left largely to the scientist. We should, however, remember that we must give him a raw material suitable for the plant he has designed. The important factor here is that the coal must have a low ash content (below 5 per cent.). It is also imperative that this coal be produced cheaply so that the final manufactured product can compete in price with alternative fuels which can be used in smokeless zones.

Turning to the carbonization industry there will be a good demand for high-grade carbonization coals for the steel industry. It is in this type of market that the west Durham coals have long established themselves as a premium product and, so long as they can produce their coal at a reasonable price, they seem to have an assured market.

The position is not so bright for gas coals. The gas industry is finding it more and more difficult

to dispose of their coke and they are now developing processes whereby gas is made without a residue of solid fuel. The most publicized of these is the Lurgi total gasification plant which uses low-grade coals of fairly high ash. The first of these plants will be in West Midlands and Scotland, but tests have shown that certain Northumberland coals give very satisfactory results. There is also a possibility that this process might also be used for the synthesis of oils and chemicals, but very little is known at the moment about the economics of this. The Wilson Committee will have a good deal to say on this point when it makes its report.

The electricity industry is likely to require a considerable increased tonnage of coal in the future. It has been estimated in the Revised Plan for Coal that the CEGB will require about 55,000,000 tons by 1965, compared with 46,000,000 tons consumed in 1959. The slowing down of the nuclear power programme which has been recently announced will further increase the demand for coal and an additional 5,000,000 tons may be required by the late 1960s. It is obvious, therefore, that the power generation field is an extremely important one for the NCB and I can visualize certain collieries going over to producing coal entirely for the CEGB.

Coal for the generation of electricity poses its own special problems because the new power stations are mainly fired by pulverized fuel and, therefore, require untreated smalls because washed smalls cannot be readily pulverized. To obtain the best possible proceeds, these smalls must be produced as clean as possible since their price is directly related to ash content. It is always uneconomic to bring dirt out of the pit and this is especially so in the case of untreated smalls. There is no cleaning plant to make a product acceptable and an average increase of 1 per cent. in ash can mean a price reduction of as much as 2s./ton. This is a particularly serious matter since smalls represent such a large proportion of a colliery's output. The corollary of this, of course, means that a 1 per cent. decrease in ash can mean a corresponding price increase. This is a very competitive market and attention to quality will be amply repaid. Careful consideration should be given to cutting in coal, and where this is not possible, every effort must be made to fill the kirvings away separately so that they are not mixed with the product.

Consistency of Oil

The future demand for general industry is extremely difficult to assess since it is in this field that we face the greatest competition from oil. The only chance we have of competing is to produce the fuel that the customer requires. This means that it must be of the correct price and quality. We must appreciate that one of the big attractions of oil over coal is its consistency. The lack of consistency of coal is far too great. In No. 2 Area of the Northern (N&C) Divisional Coal Board we had a case where the ash of a washed product varied from 7 to 14 per cent. over a shift and I have no reason to believe that we are a particularly bad offender in this respect. There are far too many complaints from customers about stone, tramp iron, bits of wood, etc., being found in the coal which results in damage to their equipment. They are quick to point out that these things do not come down an oil pipeline. It is frankly no good explaining to the customer the difficulties we face. He may be sympathetic to us, but unless we can give him what he wants, he will go over to oil.

The Best Solution

Foolproof systems must be instituted for the inspection of empty wagons to ensure that they have been properly cleaned out. No substandard product must be allowed to leave the colliery. Every effort must be made to reduce the variations in the quality of the coal being fed to our coal-preparation plants. This may mean providing additional bunkerage capacity, but this is not always necessary. At one of the washeries in the No. 2 Area of the Northern (N&C) Division we have achieved a significant reduction in the hourly variation due to more careful marshalling of the wagons of coal going into the plant. I understand that other Areas in Northumberland and Durham are experimenting with equipment which will enable a rapid measurement to be made of the ash content of coal as it flows into the plant. If these experiments are successful they will greatly assist coal-preparation engineers, but, once again, we cannot ignore the fact that the best solution is to stop the dirty coal coming out of the pit and this is entirely in the hands of the colliery manager.

The picture I have painted is not a discouraging one. We are facing a most serious challenge. In many respects it is a more serious one than we faced before the war because we have alternative fuels in competition with coal which was not then the case. The Government has stated that the consumer must have a free choice of fuel and it therefore follows that the customer must be convinced by good, consistent service of the advantages of using coal. I do not think there is any reason for despondency, but it is essential that we work as a team. Just as the pit team must work with the manager, so also must the manager co-operate with his colleagues in the marketing, coal preparation, and scientific departments in order to ensure that the coal which we put on the market is of the right quality and available at the right price.

If we can achieve this together then we can look forward to the future with reasonable confidence. If we fail, then we must be prepared for a continuing reduction in the demand for coal and the nation as a whole will become increasingly dependent on other countries for its supply of fuel.

THE Electrical Engineers Exhibition at Earls Court, London, will open on March 21, 1961, for five days.

BISRA JUNIOR STEELMAKING CONFERENCE

Casting Pit Practice

Further Papers Read at Scarborough Meeting

The second session of the 14th Junior Steelmaking Conference, held at Scarborough on June 22 and 23, was devoted to the subject of "Casting Pit Practice." Three of the papers on hot-topping practices were published in our August 19 issue (p. 405). Two further papers on the same subject are given below.

TIGERSCHIOLD HOT-TOPPING PRACTICE AT THE DALZELL WORKS OF COLVILLES, LIMITED

By T. HARRIS

(*Colvilles, Limited*)

THE Dalzell melting shop produces a multifarious range of carbon and alloy steels in both small and large ingots from fixed furnaces of 100 tons capacity. Approximately 80 per cent. of the output is cast in small ingots of approximately 4 tons weight, and the remainder is cast in large ingots of from 12 to 40 tons. Eighty per cent. to 85 per cent. of the small ingots, and over 90 per cent. of the large ingots, are of killed steel cast in wide-end-up moulds. At various times we have experimented with narrow-end-up moulds for killed steel, but never successfully. Seventy-five per cent. of our small killed steel ingots are bottom poured, the remainder, and large ingots, being top poured.

Experiments with the Tigerschiold method which, in essence, involves the hardening of a sodium silicate impregnated insulating mixture by carbon dioxide around a collapsible metal former, started in 1957 and followed a long series of experiments involving C & D hot tops, exothermic hot tops, Vallak hot tops, and other types.

From this it is apparent that at Dalzell hot topping is accepted as a necessary evil to get the quality of product required.

Our initial experiments on 4-ton ingots with the "Tiger" top, as it is now called, were suggested and carefully controlled by Mr. Tigerschiold of Degerfors, Sweden, who had patented the collapsible metal former—the "umbrella." These experiments were very successful and as they continued it became obvious that here, potentially, we had the most economic and satisfactory method of hot topping yet investigated at Dalzell.

The "Tiger" top can be located at various heights in the ingot mould giving variable weights of ingot, and on the basis of the satisfactory results of extensive experimentation it was decided to redesign the moulds to suit this method of hot topping and, at the same time, replace the existing three sizes of small inverted mould by one "Tiger" inverted mould. It was also realized that this new mould could be used with its small-end-up for balanced or semi-killed steel, as has since been proved, and hence one mould size is now used in place of five previously required for small ingot production. As can be seen from Fig. 1, ingots weighing between 84 and 64 cwt. can now be produced from this mould.

The reduction in the number of moulds, plus the elimination of head castings, has freed considerable space

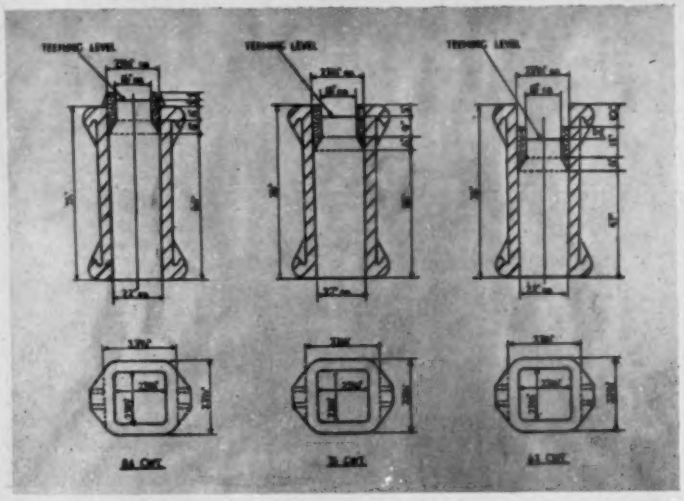


FIG. 1.—DETAILS OF SQUARE INGOT MOULDS USED WITH "TIGER" TOPS.

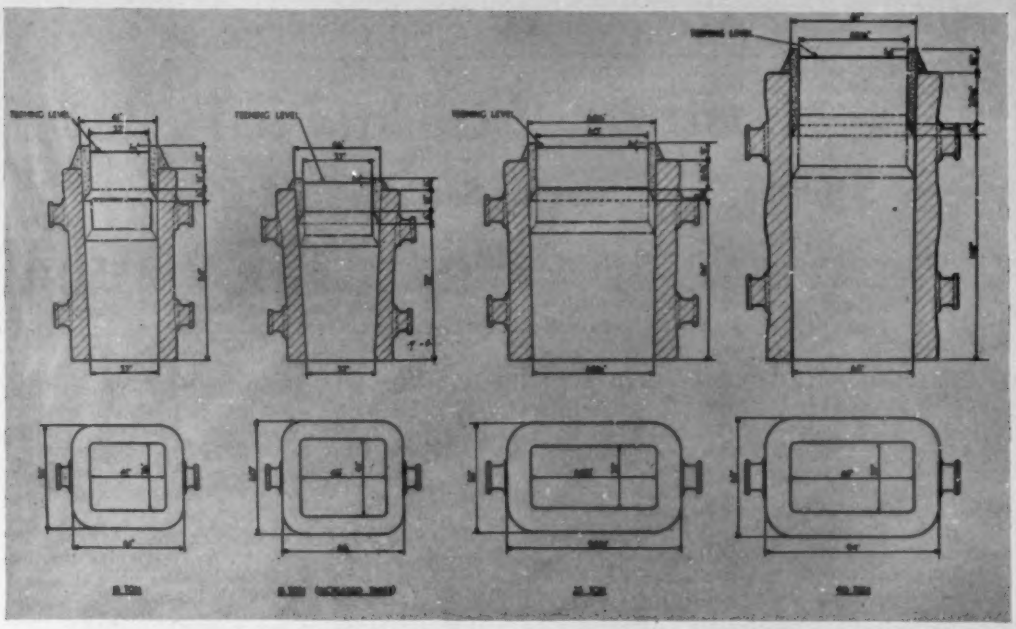


FIG. 2.—DETAILS OF SLAB INGOT MOULDS USED WITH "TIGER" TOPS.

TABLE 1.—*Details of Tigerschiold Hot Topping.*

Current mixture employed:
Two volumes crushed blast-furnace slag } Density 65.5 lb./cu. ft.
One volume crushed limestone }
7 per cent. sodium silicate—48.1 deg. Baumé.
Carbon dioxide—Line pressure 35 lb./sq. in.

	Head volume, per cent.	Mixture mass/ton, Lb.	Gassing time, Min.
4 tons ..	12.5	82	2½
15 tons ..	19	78	15
25 tons ..	20	52	15
40 tons ..	20	54	15

in the casting pit and has eased operations therein.

Experiments on large moulds were then made and these, again, proved satisfactory and economic to such an extent that the large moulds were redesigned for "Tiger" hot topping. At present it is standard practice to use one square inverted

FIG. 3.—A SQUARE AND A RECTANGULAR TIGERSCHIOLD COLLAPSIBLE FORMER.

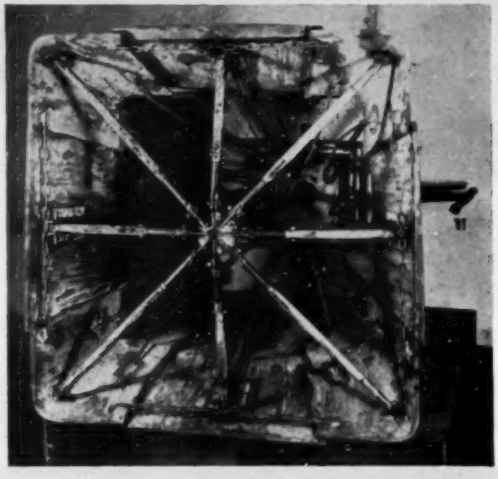


FIG. 4.—INSIDE "UMBRELLA" VIEW OF THE TIGERSCHIOLD COLLAPSIBLE METAL FORMER.

FIG. 5.—PACKING THE INSULATING SODIUM SILICATE IMPREGNATED INSULATING MIXTURE AROUND THE FORMER.

mould for forgings (15 to 12 tons in weight), and two slab moulds (40-32 tons and 25-20 tons capacity) for heavy plates (see Fig. 2). Overall this shop now casts into "Tiger" moulds at the rate of 250,000 tons per year (200,000 tons small ingots and 50,000 tons large ingots). Axially sound yields have been improved to the extent of 6 to 7 per cent. over those obtained for brick-lined detachabie castings previously used, and head costs, including royalties, are now running about 50 per cent. of previous figure.

Figs. 3 to 6 and Table 1 give some idea of the "Tiger" method of hot topping, and details such as mixture employed, head volume, and gassing times are shown. Many materials are suitable for this type of hot-topping practice, and we are constantly on the lookout for cheaper raw materials and are also considering further mechanization of our production system to further reduce our hot-topping costs.

As far as metallurgical quality is concerned, the tops of many ingots have been sectioned and analyzed to ensure that segregation was eliminated at the standard crop.

In conclusion, the method has proved such a practical and economical proposition that "Tiger" hot tops have now been introduced for large ingots in two other plants of the company. Some of the more important advantages accruing from this process are as follow:—

(1) Increased axially sound yields by 6 to 7 per cent. of slabs or billets with consequent reduction in cost of rolled prime product.

(2) Reduction in conditioning costs of the rolled products through elimination of "hanger" cracks in the ingot.

(3) Reduction in head costs through elimination of head castings and replacement of skilled bricklaying and mould-headsmen manpower by labourers.

(4) Reduction in casting pit congestion through minimizing type and number of moulds required for varying ingot weights. This has had the indirect effect of reducing tapping delays caused, for example, by awaiting setting of pits.

(5) For forging blooms and plate manufacture where exact yield weights are required from the ingots, the ability to vary actual ingot weights (par-

FIG. 6.—IN THE BACKGROUND "TIGER" TOPS ARE BEING HARDENED BY PASSING CARBON DIOXIDE THROUGH THE MIXTURE: TO THE RIGHT ARE SEVERAL COMPLETED TOPS.

ticularly in the case of special steels) is attractive.

(6) We have also found that the lives of our redesigned moulds exceed those which they replaced.

PRODUCTION OF HIGH-CARBON KILLED STEEL INGOTS WITHOUT USING HOT TOPS

By J. G. WILSON

(*John Lysaght's Scunthorpe Works, Limited*)

UNTIL the end of 1945 the main production of killed steels at Normanby Park Steelworks was mainly confined to high-silicon electrical steels, which were produced in wide-end-up moulds using a superimposed head. The remaining ingot output consisted of low-carbon rimming steels, together with leaded and sulphur free-cutting steels teemed into narrow-end-up moulds. During the war years various carbon shell steels were produced using the same method as for silicon steels, but this was a very small proportion of the total production, and the carbon content rarely exceeded 0.40 per cent. More recently, a substantial tonnage of steel of up to 1 per cent. carbon has been produced.

Since carbon steels are of more general interest, this paper will consider the production of these rather than silicon steels, which are a more specialized product. It will show how circumstances led to the investigation of factors affecting the yield of sound billets and the formulation of a routine practice for the production of killed steel ingots in narrow-end-up moulds without hot tops that results in a high yield of sound billets.

Due to the inability to obtain spares, it became necessary to abandon the established practice and to use plain narrow-end-up moulds without hot-topping. There was a fall in yield, but this was not critical. This type of mould was favoured mainly for the easier stripping practice and not for any metallurgical properties. Narrow-end-up moulds with either brick or tile inserts were given a trial, but the results did not justify their adoption, compared with the superimposed head hot-topping practice.

The mould in use at this time was 19 in. square and gave an ingot of about 45 cwt. The ingot practice adopted, that is, narrow-end-up moulds without hot tops, was found to give a definite decrease in yield, but, surprisingly, no real trouble due to segregation in the ingot occurred. This practice was continued with complete satisfaction until 1949, when, due to plant changes, the casting pit routine became subject to interruptions and ingot yields extremely variable and segregation became evident. At this time the conversion of the open-hearth furnaces from 60 to 120 ton capacity was in progress and for a long time the shop operated in two halves, with both sizes of furnace operating and with inadequate teeming and stripping facilities. The pit-side was congested and it was not possible to draw out complete heats on the narrow-gauge rail system in use. Heats, therefore, had to be split, and the hydraulic stripper, which was extremely slow, necessitated moving heats as rapidly as possible in order to handle the increased tonnage.

These conditions resulted in some casts being moved rapidly and others standing several hours due to traffic delays. In addition, there was a shortage of ingot moulds and often moulds had to be teemed into while nearly red-hot. Consequently, during rolling it was found that some ingots possessed liquid centres which often bled during the earlier part of cogging operations.

Metallurgical Considerations

The demand for and, consequently, the output of carbon steels was growing and the extremely variable yields and quality were unsatisfactory and required urgent attention. Examination indicated immediately that the lowest yield and highest segregation was always associated with rapid movement and charging of ingots into the soaking pit. In short, the plant changes were causing quality troubles arising from extremely variable casting and rolling temperatures.

Metallurgically it seemed undesirable to charge ingots to soaking pits with liquid centres, since this would slow down the total solidification time and increase the segregation from outside to centre. In addition, the ingot, if still liquid would bleed and result in internal oxidation during rolling. Examination of billet samples from ingots charged while their centres were still liquid showed that both segregation and pipe were more severe than ingots which had solidified completely before charging.

It was therefore decided to attempt to determine the total time for complete solidification using two methods:—(*a*) Inserting thermocouples into the ingot after opening up the top with an oxygen lance, and (*b*) by spilling short ingots (too short for rolling) after various intervals of time after teeming. This latter method is not so precise and for a long time method (*a*) proved impossible. After trying different types of sheaths it was eventually found that a silica sheath surrounding a mullite one, used with a Pt-Pt/Rh thermocouple was satisfactory.

Having obtained the time for complete solidification the practice that all carbon steels should be teemed and left standing until solid before moving to the stripping bay was laid down. A steady increase in yield and a lowering of the degree of segregation resulted and this practice was maintained.

The effect of changes in plant conditions and casting practice on prime yield can be summarized as follows:—

(1) From 1946 to 1949, by changing from hot-top to narrow-end-up moulds, the yields fell by 7 per cent. This decrease was partly due to the mould change and partly due to the plant conditions accompanying the expansion programme.

(2) In 1950, after introducing standing times on a somewhat limited basis, 5 per cent. of the yield was regained.

(3) In 1951, with complete standing time practice, there was a gain of an additional 4 per cent.

(4) As the new practice became established a further improvement in yield became evident: the average yield for the last eight years has been 0.3 per cent. above the 1951 figure.

During 1950 there was a gradual change from a 19-in. to a 23-in. ingot, weighing 4 tons, so that it became necessary to re-determine the freezing time. Carbon steel production increased from 40 ton/week in 1949 to 700 ton/week today and the carbon specification gradually changed from 0.40 per cent. C to 1.00 per cent. C.

Temperature Control

After instituting standing times for ingot solidification it was realized that the teeming temperature ought to be controlled and on the basis of experience suitable tapping temperatures, depending on the last bath carbon, were drawn up. These tempera-

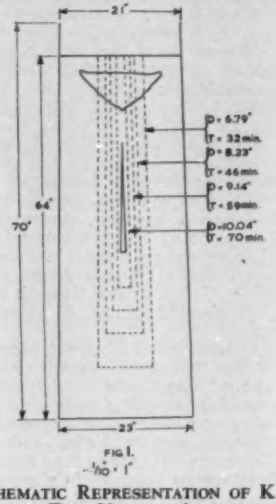
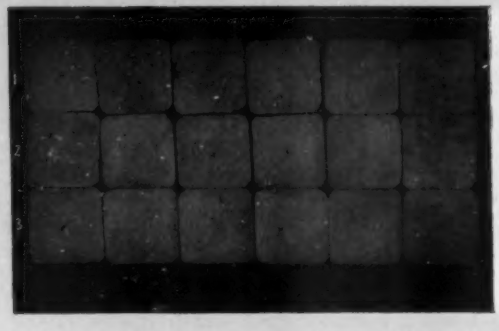


FIG. 7.—SCHEMATIC REPRESENTATION OF KILLED INGOT STRUCTURE. THE VALUES ALONGSIDE REPRESENT THE THICKNESS (D) IN INCHES OF STEEL SOLIDIFIED IN CORRESPONDING TIME (T) IN MINUTES.

tures are essentially the lowest possible without encountering appreciable ladle skulling. With higher firing rates on the furnaces this is difficult to achieve consistently and requires constant bath temperature measurement from the time of being melted.

Re-examination of the problem suggested that two inherent disadvantages might accrue from longer standing. (1) Longer times in the mould would be expected to reduce mould life. (2) Charging of cooler ingots might increase soaking times and fuel per ton for heating. However, no evidence to prove that these disadvantages were measurable has been obtained; this may be because variable shop conditions masked such relationships as that between the heating times for rolling and track time. It should also be remembered that



PERCENTAGE OF DISTANCE FROM TOP OF INGOT						
(1)	5.0	10.8	16.5	22.3	28.1	33.9
(2)	3.8	9.6	15.4	21.2	26.9	32.7
(3)	6.2	11.9	17.7	23.5	29.2	35.0

FIG. 8.—BILLET SECTIONS FROM INGOTS OF THE BEGINNING, MIDDLE, AND END (1, 2, AND 3, RESPECTIVELY) OF A CAST. FREEDOM FROM PIPE CAVITIES IS APPARENT.

the disadvantages may well be concealed because the total carbon steel make per week is only 6 per cent. of the total output.

Using a narrow-end-up mould, on some carbon steels, it is impossible completely to remove all segregation since the last metal to freeze is at the base of the major pipe and in the secondary pipe zone.

Billet Quality

It would seem that the conditions for obtaining high yields depend on the formation of a solid ingot top crust, which will prevent any oxidation of the major pipe during soaking, together with a satisfactory solid zone between the major and secondary pipes. After temperature measurements during the freezing of ingots it was concluded that the ingot looks like Fig. 7. None of the 4-ton ingots was sectioned and the conclusions regarding piping and segregation have been based solely upon bloom and billet examination. The extent of the secondary pipe in Fig. 7 is therefore by no means exact.

Inserting hot-top tiles into the mould has often

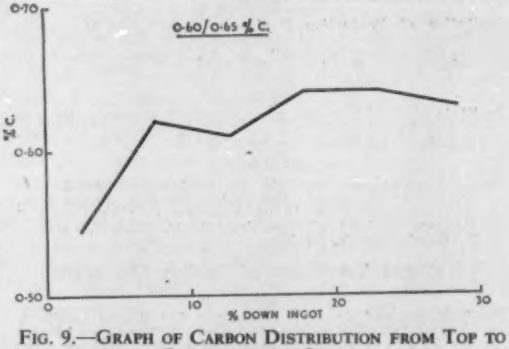


FIG. 9.—GRAPH OF CARBON DISTRIBUTION FROM TOP TO BOTTOM OF THE INGOT.

destroyed the junction between major and secondary pipe and resulted in piping to the extent of 50 per cent. down the ingot. It is possible that subsequent mechanical working to the billet stage offsets the ingot segregation in the secondary pipe area and promotes carbon diffusion.

Fig. 8 shows billet sections from ingots taken at equal intervals throughout the cast. Even with the routine standing time practice, it is found occasionally that the latest teemed ingots have a greater degree of piping than the earlier teemed ones, probably because, with a later casting time, these ingots may not be quite solid when stripped.

Billet samples analysed for carbon give a carbon distribution as shown in Fig. 9. The first sample presents a common effect and is due to carbon being oxidized during soaking. A rise of carbon content about 20 per cent. down the ingot is associated with the junction between major and secondary pipe.

Taken as a whole, this rather simple practice provides a satisfactory quality for the applications required. Most of the carbon steel is destined for wire drawing, which is an extremely critical application since any segregation in the rod will inevitably result in "cupping" and fracture during drawing when drawing to finer sizes.

THE USE OF C&D HOT TOPS

With reference to the paper by W. A. Jenks on "The Use of C&D Hot Tops," published in our August 19 issue, the sentence on p. 408, right-hand column, line 5, beginning "A feature . . ." should read:—"A feature which has been found since using the C&D hot top is the complete absence of hanger cracks, these being previously quite a problem when using a superimposed-type head box."

FORTHCOMING EVENTS

SEPTEMBER 15

Institution of Plant Engineers (Blackburn Branch):—Meeting at the Castle Hotel, Blackburn, at 7.30 p.m. "New Developments in Fuel and Power Technology," by Prof. M. W. Thring, vice-president, Institute of Fuel. Joint meeting with the North-Western Section of the Institute of Fuel.

SEPTEMBER 21

Insitution of Production Engineers:—Meeting at the Royal Commonwealth Society, London, at 6.30 p.m. "The Cult of the Self-made Man" (E. W. Hancock paper), by John Marsh, director of the Industrial Welfare Society.

OCTOBER 3

Institute of British Foundrymen (Sheffield Branch):—Meeting at the Technical College, Pond Street, Sheffield, at 7 p.m. Presidential address.

OCTOBER 8

North of England Institute of Mining and Mechanical Engineers:—Meeting in the Lecture Theatre, Neville Hall, Newcastle-upon-Tyne 1, at 2.30 p.m.: "The Use of Hydraulics with Coal Ploughing," by R. R. G. P. Jackson, T. Harris, and T. Sneddon.

National Association of Colliery Managers

SEPTEMBER 14

North of England Branch:—Meeting at the Mining Institute, Neville Hall, Newcastle-upon-Tyne 1, at 2.30 p.m. Address by Sir James Bowman, chairman of the National Coal Board.

New Literature

NEW catalogues, booklets, and other publications which have recently been received include those mentioned below. Readers wishing to obtain a copy of any of the publications referred to should apply direct to the address given, at the same time mentioning IRON AND COAL.

W. C. HOLMES & COMPANY, LIMITED, P.O. Box No. B7, Turnbridge, Huddersfield—Publication No. 200 deals with the range of materials handling plant manufactured by the associated company, Holdan Engineers (London), Limited.

DENVER EQUIPMENT COMPANY, 1400, Seventeenth Street, Denver 17, Colorado—Latest issue of Deco Terfoil, a quarterly magazine, "honours the mining industry in Canada." It contains a special eight-page supplement on Agnico Mines, Limited.

RUBBER IMPROVEMENT, LIMITED, Wellingborough (Northants)—While dealing specifically with the company's "Green Bond" conveyor belting, an attractive booklet just released is, at the same time, a general reference work on conveyor belting. As such, it will be found of considerable value.

RUSTON-BUCYRUS, LIMITED, Lincoln—The Digger is compiled "by, for, and about" the company's employees and is a lively and well-produced magazine. The summer number, enriched by the use of colour printing, contains a number of interesting articles and features in addition to many pages of news.

CROFTS (ENGINEERS), LIMITED, Bradford 3—Details of "Ultivee" rope drives, which are an addition to the company's existing range, are given in a new brochure. Compared with orthodox V-rope drives, it is claimed that the "Ultivee" rope drives transmit more power in less space, reducing the number of ropes by as much as 40 per cent.

CORROSION, LIMITED, Warsash Road, Warsash, Southampton—A folder has been issued containing full information about "Furnascote," which covers a series of refractory coatings designed to protect the walls of boiler and other furnaces. "Furnascote" gives a monolithic, vitreous, airtight lining and the glazing considerably increases efficiency. The material can be used with advantage on furnaces in almost any condition. It is claimed that, in many cases, furnace walls are protected for a number of years when so treated, the application being only from $\frac{1}{16}$ to $\frac{1}{4}$ in. thick, depending on roughness of surface. There are grades of the vitreous material capable of resisting temperatures from 815 deg. to 1,650 deg. C. The most popular range, it is stated, is "Universal" (non-vitreous), giving a smooth matt white surface to refractory linings and withstanding temperatures up to 1,910 deg. C.

"Witton-Kramer" Lifting Magnets

The engineering group of the General Electric Company, Limited, has extended its range of circular electric lifting magnets to include two new sizes, namely, 30-in. and 80-in. dia. magnets. Full information of the new sizes is given in the revised edition of Technical Description No. 379. In addition to standard circular lifting magnets, GEC makes many other types including those suitable for salvaging steel and iron cargo from the holds of sunken ships; for handling hot ingots up to 650 deg. C., for lifting coils of steel strip, and for charging rotary furnaces with operating temperatures up to 1,000 deg. C.

Implications for Mining Engineers

in the

REVISED PLAN FOR COAL

By W. V. SHEPPARD*

Held at Southport in June, the annual conference of the National Association of Colliery Managers was devoted to an examination of the "Revised Plan for Coal." The conference opened with a paper by Mr. Sheppard entitled "Introduction on the Revised Plan," here presented together with a report of the discussion.

THE National Coal Board's "Revised Plan for Coal" differs from its predecessors in many ways, but first and foremost it is different because it is based upon a fairly specific estimate of future demand, broken down into tonnages of coal by types and with proper regard to consumers' geography—in effect, "how much coal can we sell?" And how much of the total should each division set out to produce?

Until recently—and certainly for a period of 20 long and difficult years—colliery management in the United Kingdom has been urged to produce maximum outputs at each and every pit for virtually six days a week, with the added burden in the last 10 years of modernizing the run-down industry simultaneously with the need for maintained tonnages and in spite of the conflicts and headaches thereby involved. Saturdays have—in this context—blessedly gone, and gradually the load of modernization will decline.

Changed Scene

Today, for the first time for all mining men, there are competing fuels in our midst; for the first time for many of us the quality of product is of hourly and vital importance, and for most there arises a new experience of strict efficiency and cost control of coal mines that has not been with the industry since the 1930s.

Stripped to its barest bones the problem—indeed, the challenge—is to extract coal from depth, to prepare it and to distribute it so that, on level terms, coal can compete with oil, compete with the atom, compete in the export market, and provide the country with a flourishing basic industry for generations to come.

Ample funds have been put at the disposal of mining engineers to modernize the pits, and the board intends to continue this process until maximum reasonable efficiency is obtained. But as yet we are a long way from seeing a proper return on the massive investments presently in hand (with notable individual exceptions), and certainly mining engineers have not generally achieved the necessary break through in efficiency (o.m.s.) to counter the rising capital charges involved, charges made up as they are of interest on borrowings and depreciation on use.

Here, then, is the number one daily, weekly, monthly, yearly, and dedicated task for all colliery managers—a more rapid climb in output per manshift with the least possible additional capital expenditure to help in the struggle. If there is failure, mining engineers can never say that the necessary funds were not made available to enable them to enjoy the best possible facilities, the most modern techniques and up-to-date appliances. However, ultimate performance is not in the hands of management alone, and all whose security and livelihood depend on economic pits should understand the challenge and the responsibilities, that go with working in the publicly owned mining industry today, and behave accordingly.

Thirty hundredweights overall o.m.s. for all pits next year instead of, say, in 1964, would be sheer "gold." Technically, the facilities exist for just that, and with the deliberate run down in open-cast operations there surely follows the additional challenge to try to make good this loss of profit by even cheaper deep-mined production: o.m.s. (sometimes thought of in terms of organization, maintenance, and supervision) will also be at a premium should the demand be there without an apparently adequate labour force.

If individual pits are to be kept in production, colliery management must continually strive to turn out the cleanest possible prepared product, and never, never take the attitude of "getting away with it as much ash in the coal as possible, it helps costs, it helps o.m.s. figures." So it may for a short period of time, but the damage to

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future market potential is far beyond these considerations, and colliery managers are asked to consider just how they can sensibly make better the mineral mix presently going into long-suffering preparation plants and just how they and their people, can, wagon by wagon, ensure that the most attractive fuel is leaving the sidings, commensurate with natural seam conditions.

The National Coal Board's largest single customer is "Mr. Power Station." In 1960, electricity generation in the United Kingdom will involve some 50,000,000 tons of coal, and the call for electricity is rising year by year. It is likely that untreated small coal will therefore be increasingly in demand in the years ahead, but the growth of this business, and its effect on the board's fortunes, will inevitably depend on the nature of the product on offer and its geographical attraction to "Mr. Power Station." Ingenuity, skill, energy, care, and supervision are called for to guarantee at all times a consistent product carrying the bracket of ash percentage laid down. "Let the washery take care of it," is an untenable approach to this particular marketing problem.

Approach to the Problems

In many respects the revised plan is a compromise between "all out" commercialism *versus* a reasonable approach to the social and geographical problems involved. Profit-earning outcropping is to be virtually abandoned, and there is to be quite proper loading up of the low-cost divisions. The future demand for special coals (*e.g.*, from South Wales and Durham) has been catered for, so that the heaviest contraction falls inevitably on the Scottish, Northern (N & C), and North-Western divisions.

An often overlooked, but very relevant factor, is the coal industry's wages cost content in a competitive world. It is an inherent feature of coal affairs that wage cost per ton is an unusually large percentage of total costs of production. The competing fuels of oil and atomic energy are not so saddled. As the wage "creep" goes on, therefore, coal is at a substantial disadvantage to its rivals, whose capital content of cost dominates, and not wages cost.

Progressively the coal industry must strive to attain more of a "compound" increase in straight efficiency to negative this traditional handicap. New constructions, reconstructions, and the programme of face mechanization are slowly (all too slowly), but surely lifting productivity overall. In brutal terms it is now running at a level some 40 per cent. above that achieved nearly 50 years ago. During this last half century so much dramatic progress has been made in other spheres of technical progress that one wonders whether we have indeed yet found the right fundamental approach.

Coal reserves in the United Kingdom lying at a shallow enough depth to permit of highly efficient bord-and-pillar methods of extraction are now negligible, and so we plod along, almost exclusively, on an advancing longwall pattern, with all its requirements of labour in support, just as we have done for so long. The search for an alternative pattern of extraction is surely worth a great deal of original thought and study.

DISCUSSION

MR. E. L. EVANS said that over the last two years colliery managements had found that, instead of building up productive capacity, they were entering a period of retrenchment, and that there were economic factors arising which were different from those handled in the past. The previous plans had catered for an increasing demand; the 1959 plan catered for a reduction.

If the standard of living in Britain were such that every citizen consumed on average about 4 tons of coal a year, and in America the consumption per head was 6 tons or more a year, what action was being taken to step up the demand here, to increase our standard of living to something akin to that of America, where economic competition was just as severe as in his country. He also wondered whether an examination had been made of the possibilities of making substantial economies in the costs of distribution, particularly to some of the power stations.

MR. SHEPPARD said he was grateful for Mr. Evans's remarks. It was not a bad thing to look at the marketing side first. He and his colleagues were far from overlooking the fact that the best place for a power station was nearest to the source of coal supplies.

MR. G. RADFORD recalled that years ago, when he was a student, he was told that longwall retreating was the best method of mining, driving out a heading, getting the coal while retreating back to the shaft, and leaving the bad work behind. But, although there was plenty of money to spend and plenty of workmen, too, that method had not been adopted, to his knowledge. He thought it was the best method.

MR. SHEPPARD said that a paper to be given by Mr. H. A. Longden (director-general of production) included reference to retreat mining. Recently he had spent a month in Nova Scotia, where only now, in a very old coalfield, was longwall retreating on an experimental basis being put in hand. Surely the first requisite, with the machinery available today, was to have enough coal to go out to; there could be narrowing, and it was a little difficult and costly when seams came down to the 2-ft. region. One of the problems which they must be satisfied they could solve each day was the proper ventilation of the area in which they were working. On paper there was such a lot to commend the system, but in the pit quite a lot of things prevented a rapid approach. When he had posed the question as to whether mining engineers were right fundamentally in the way they set about extracting coal at depth, he was hoping that the meeting would look perhaps a little beyond longwall advancing and longwall retreating.

MR. T. SMITH (Scottish Branch), reverting to the question of the standard of living in this country relative to that in America, said that it was a matter of prime importance. Was it envisaged that there would be a sliding down of the importance of this country in the industrial sphere?

MR. SHEPPARD assured the meeting that those engaged in drafting the modified plan had before them and had taken into full account the Government's estimate and the experts' forecasts of the standard of living over the years. The plan was not based on a static standard of living. The situation involved not only coal, but the entire energy field, and the proper and most likely share for coal was written into the plan.

Scottish Colliery Accidents

REPORT BY HM DIVISIONAL INSPECTOR

ALMOST half of the fatalities in the Scottish coal-mining industry during 1959 were caused by the underground fire at Auchengeich Colliery on September 18. The total number of deaths last year showed an almost threefold increase compared with 1958, states Mr. H. Hyde, HM Divisional Inspector of Mines, in his report (Stationery Office, 3s. 6d.) under the Mines and Quarries Act, 1954.

Of the 95 fatalities which occurred in 1959, 47 were at Auchengeich Colliery and the remainder, 48, showed an increase of 50 per cent. compared with 1958. It is relevant to point out, states the inspector, that the number of persons killed in that year was the lowest on record, and that in no other previous year had the number of fatalities been less than 48. Nevertheless, no matter what comparisons one takes the increase was tragically high.

The number of persons seriously injured was also higher when compared with 1958 or for the previous three years. A summary of the persons killed or seriously injured in 1959 is given in Table 1. Falls of ground accounted for 34.8 per cent. of all killed or seriously injured. Nine persons were killed and 28 seriously injured by falls of roof at the working face, compared with six and 25, respectively, in 1958.

Accident on Longwall Face

The most serious accident took place on a longwall face in a 6-ft. seam with a sandstone roof which was at least 40 ft. thick. The seam had been worked with a prop-free-front system of support, but shortly before the accident occurred the method of working was changed to hand getting with a conventional support system. Two face men were removing supports in order to advance the conveyor when the roof collapsed up to the coal head for a distance of 70 ft. along the face and they were buried. The district was near the end of its life and was abandoned after the fall took place.

TABLE 1.—*Persons Killed or Seriously Injured at Coal Mines Working under the Mines and Quarries Act, 1954, compared with the Average for 1956-58.*

Classification of accident.	Killed.		Seriously injured.	
	1959.	Average 1956-58.	1959.	Average 1956-58.
UNDERGROUND.				
Falls of ground:				
Face working:				
(*a*) Falls of roof	9	7.3	28	21.3
(*b*) Falls of face or side ..	1	1.4	33	21.7
Roadheads	7	7.6	24	25.4
Other falls	4	3.0	9	10.3
Total falls	21	19.3	94	78.7
Haulage and transport	10	10.0	71	52.7
Miscellaneous causes	58	17.7	49	45.9
Total underground	89	47.0	214	177.3
,, surface	6	5.0	21	23.0
Total underground and surface	95	52.0	235	200.3

One person was killed and 33 seriously injured by falls of face or side, compared with one killed and 26 seriously injured in 1958. The fatal accident occurred to a coal-cutter operator on a longwall face rising inbye at a gradient of 1 in 15 in a working consisting of 19 in. of hard top coal and 18 in. of friable bottom coal separated by 18 in. of hard fireclay. The face had been undercut to a depth of 4 ft. and the coal cutter was being manœuvred into a rib-side cundie when a 10-ft. length of top coal, having an overhang of 3 ft. at one end and 1 ft. at the other, came away and pinned the cutterman to the floor. This accident could have been avoided had the top coal been dressed down or supported properly.

As in previous years, the majority of accidents from falls of face or side took place when men were working in front of the face while cleaning up gummings or loose coal.

These accidents were due mainly to the failure effectively to sprag or dress down the face of the undercut coal.

Dangers at Roadheads

Seven persons were killed and 24 seriously injured by falls at roadheads, compared with seven and 31, respectively, in 1958. The most serious accident took place in an undulating narrow drivage, 11 ft. wide, which was being advanced in a 10-ft. thick seam to prove an area disturbed by minor faulting. A supervizing collier and his trainee were found dead, evidently having been killed when they were buried by a large fall of coal from the coal face. The fall had occurred between a 6-ft. downthrow fault crossing the face at an angle of 60 deg. and a free end formed at a junction of an old unsupported roadway across which the drivage had advanced into the solid.

The investigation of the accident indicated that under the difficult conditions caused by the faulting, the place had been supported in a workmanlike

manner with wooden side chocks, crowns, and cross bars, but that the standard of spragging was not uniformly high.

Accidents from haulage and transport caused 24.6 per cent. of all killed or seriously injured. Eight persons were killed and 25 seriously injured in the North-East Scotland district; an increase on the already high figures for 1958.

Tub haulage caused 80 per cent. of the fatal accidents and 75 per cent. of the non-fatal injuries. It is especially disturbing, states the inspector, that this is so when modern systems are coming more and more into use.

The provision of suitable safety devices, particularly as a safeguard against runaways, must be given special attention and it appears that it is necessary for a crucial review to be made of the adequacy of such installations.

Six ignitions of inflammable gas were reported. Two occurred within a space of three days at a remote naked-light mine, where coal had been mined for centuries. On both occasions, inflammable gas was ignited by the flame of an acetylene cap lamp while a newly drilled shothole in machine cut coal was being charged with explosive. Safety lamps were installed at once as a result of these occurrences.

An acetylene lamp was the means of igniting inflammable gas in a cavity in another naked-light mine. A 14-ft. seam was worked by the stoop-and-room method with 9-ft. high levels and headings, the remaining top coal being recovered on the retreat. A collier was standing on loose coal shot down in the getting of the top coal while he was examining the roof conditions when the ignition took place, but fortunately he escaped injury. Safety lamps were used thereafter. These mishaps again show the dangers of naked lights even in mines in which they have been used for many years.

One ignition of firedamp occurred due to sparking in the undercut during coal cutting on a longwall face, compared with five such occurrences in 1958.

The use of the compressed-air/water mixing device to provide a water mist in the undercut, described in the report for 1958, was extended and gave satisfactory results.

A faulty drill cable was the means of igniting firedamp while it was being used with an electric drill to bore a shothole in coal on a longwall face in the vicinity of a fault. A short circuit occurred at a part of the cable which had previously been repaired, and examination showed that some of the broken strands in the repaired joint had penetrated the insulation and caused a short circuit to an adjacent core. Although the protection devices operated, the resultant arcing was such as to light the inflammable gas.

The fall in the demand for coal in 1958 was accentuated in 1959 and there was a contraction of output from 19,468,000 tons (1958) to 18,882,000 tons.

With only 184 NCB mines working and 78 operating under licence, the combined total of 210 was a reduction of 21 mines compared with the previous year. Output per manshift at the face increased during the year from 53.2 cwt. in 1958 to 57.3 cwt. and the overall o.m.s. from 19.5 to 20.9.

Electrical Distribution at Agecroft Colliery

ESTABLISHMENT of Agecroft Colliery in the North-Western Division of the National Coal Board is part of the board's plan to maintain the output of Lancashire coal after the closure of spent and uneconomic pits. Agecroft Colliery lies to the east of Prestwich, in the Manchester Area, in a field of relatively easily gained coal 3½ miles in extent. Work on the colliery started late in 1953.

Crompton Parkinson, Limited, has supplied a large quantity of metalclad switchgear for the colliery. The switchgear supplied comprises mainly a 23-unit ALA 1 switchboard 11-kV 250-MVA single busbar, together with a 15-unit ALA 1 3.3-kV 50-MVA duplicate busbar switchboard and an associated 24-unit remote control board housing the control, instrumentation, and protection equipment, with a mimic diagram showing the 11- and 3.3-kV and the low-voltage distribution systems.

Incoming supply is taken from the North-Western Electricity Board's No. 1 sub-area 11-kV network. On the full mimic diagram, which occupies the centre of the board, coloured lamps are used to show the positions of the various switch units, *i.e.*, O.C.B. on/off. The remote board also includes sections which control two 11-kV switch units acting as reactor shorting switches associated with the colliery's 2,250-h.p. compressor motors.

The 11-kV switchboard is equipped with solenoid-operated circuit breakers, the d.c. supply for energizing the solenoids being obtained from a battery. The 3.3-kV switchgear incorporates oil-breakers of the direct manually operated pattern.

Agecroft Colliery, which is the successor to an old colliery of the same name which was closed in 1932, will have cost about £8,500,000 on completion and the NCB outline plan under which it was designed foresaw an eventual annual output of 876,000 tons. Coal production is expected to begin shortly, and output is planned to rise to 3,500 tons per day around 1963. Workers will be transferred to Agecroft from the nearby uneconomic Wheatsheaf and Newton pits, which will be closed down.

FUEL ECONOMY in the *Iron and Steel Industry*

ACHIEVEMENTS OF THE PAST 40 YEARS

Remarkable economies in fuel consumed per ton of steel have been made in the past 40 years, as the following statement by the British Iron and Steel Federation clearly shows. These economies have been made by improving the fuel efficiency of established processes and by the introduction of new processes. The outlook is encouraging because, in addition to other less spectacular developments, the continuous casting of steel, which has now reached the commercial stage, will effect substantial savings in fuel.

BECAUSE of the size of the iron and steel industry and the need to conduct the processes at very high temperatures, the industry is a major user of fuel, consuming more fuel and power than any other manufacturing industry in Britain.

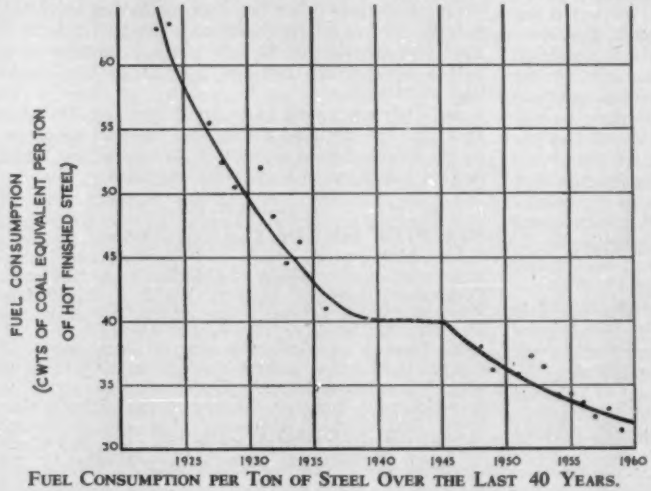
In 1959 the industry used the following quantities of major fuels:—Coking coal, 14,500,000 tons; non-coking coal, 3,500,000 tons; bought coke, 1,750,000 tons; fuel oils, 2,000,000 tons. In addition, about 70 per cent. of the electricity used, equivalent to approximately 2,750,000 tons of coal, was purchased.

The cost to the industry of this energy usage currently approaches £200,000,000 and is equivalent to about £8 for every ton of rolled steel made, constituting 20 per cent. of the cost of the steel. Hence fuel economy is vital in the production of steel and the subject has received, and continues to receive, much attention.

The achievements to date in this field are impressive, as evidenced by the fact that since 1930 the fuel consumption per ton of steel has been almost halved. It is now some 1¼ tons of coal equivalent, as compared with nearly 2¼ tons in 1930. The improvement is illustrated in the accompanying graph. Had there been no improvement in fuel efficiency in the industry since the war, a further 6,000,000 tons of coal would have been required in 1959. There are many reasons for the improvements, particularly the progressive application of new techniques and the increased integration of processes.

Pig-iron is essential for most steel manufacture and the production of pig-iron accounts for about 60 per cent. (gross) of the total energy input of the industry. However, by reason of the utilization, particularly in integrated plants, of the exit gases as a fuel for other purposes (such as for heating the coke ovens, boiler firing, and heating of the stoves to provide the hot blast for the blast furnace), the ironmaking process itself provides for about a third of the total net energy requirements.

A marked reduction in fuel use has been achieved particularly by improved burden preparation. It is now the practice for the blast-furnace raw material to be crushed and screened, and the ore fines which was formerly charged direct to the furnace are now agglomerated into suitably sized lumps by sintering. This process consists basically of the controlled combustion of coke breeze, a by-product from coke manufacture formerly of no great value, admixed with ore fines. Some beneficiation of the ore results at this stage due to the removal of moisture, carbon dioxide in carbonate ores, and sulphur. With this improvement in the physical and chemical nature of the burden, the blast furnace operates more smoothly, which is particularly



FUEL CONSUMPTION PER TON OF STEEL OVER THE LAST 40 YEARS.

vital with the larger units now in operation. Productivity is increased and the coke used per ton of iron is reduced.

Post-war Progress

In 1929 about one-half of the blast furnaces had an average capacity of 400 ton/week, whereas today an output of 1,400 ton/day from the large furnaces now installed is not considered exceptional. The improvement has been spectacular since the war. In 1946, 22 cwt. of coke was required on the average in the blast furnace to produce a ton of iron, whereas in 1957 the requirement had fallen to 19 cwt. and is currently 16½ cwt. Associated with this improvement has been the growth of sintering from a production of 2,500,000 tons in 1946 to a capacity of 17,000,000 tons at the present time. The reduced use of the coke in the blast furnace, however, may cause a problem because the resulting blast-furnace gas may have a much lower calorific value (approximately 80 BThU per cu. ft., as compared with the normal 95/100 BThU per cu. ft.), and presents difficulty in combustion, without enrichment.

In the steelmaking process itself, which accounts for approximately 15 per cent. of the total net energy used, fuel requirements have been reduced over the years by increasing the proportion of liquid pig-iron in the open-hearth furnace and the adoption of liquid-fuel firing in place of producer gas. In 1957, 15,000,000 tons of the 19,000,000 tons of open-hearth steel was produced in furnaces using fuel oil or coal tar fuels with an average fuel consumption one third less than in the case of producer-gas fired furnaces. Other benefits resulting from the use of liquid fuels are the more ready control of the flame and simplification of the furnace structure—regenerators for preheating the fuel not being necessary.

It would appear that such improvements as have been effected may be completely overshadowed by those which can result from the much increased use of oxygen in steelmaking. Already it has been demonstrated that a reduction in fuel consumption in modern open-hearth type furnaces, *e.g.*, in the "Ajax" process, from about 40 therms per ton in current best practice to below 10 may be expected by the use of some 1,500 cu. ft. of oxygen per ton of steel, the oxygen being used for flame enrichment in the early stages of the process and injection into the bath of molten metal by means of a supersonic jet during the later stages to speed the removal of carbon and other impurities.

The LD Process

Rapidly gaining favour throughout the world is the post-war developed LD steelmaking process by means of which pig-iron with, in some cases up to 40 per cent. scrap, is converted rapidly to high-grade steel with a low nitrogen content. A jet of high-purity oxygen is directed vertically downwards on to the metal surface. As in the case of the conventional Bessemer, no fuel is required for the heating of the charge, and in Austria the energy recovered from the exit hot waste gases is sufficient to generate the oxygen required for the process. The gas volume is less than in the case of the Bessemer and, hence, removal of the dust and fume can be fairly readily effected, which is an additional important point in its favour. The process is particularly suited to the production of low-carbon steels and is to be installed at the new strip mills at Newport, Ravenscraig, and elsewhere.

A further new oxygen steelmaking process is the Kaldo, which employs a rotating inclined vessel. It is claimed that the process is more thermally efficient by reason of the combustion in the furnace chamber of the carbon monoxide produced. The process appears well suited to the production of high- and medium-carbon steels. Tonnage oxygen plants to meet these requirements are being increasingly installed in steelmaking centres.

Another new process which has now reached the commercial stage and which offers the opportunity for further integration of processes is continuous casting. Further plants are to be installed. By this means a semi-finished product such as a billet or slab may be produced directly from the molten steel thereby obviating the fuel required for the reheating of the ingot for rolling and the power required for rolling.

The energy required for these two stages in manufacture amounts at present to about 7 per cent. of the total demand.

In the rolling and finishing processes, which account for about a third of the total net energy use in the form of electric power and heating, the introduction of continuous mills has markedly reduced fuel requirements as compared with earlier hand mills. A number of developments offer the promise of a further reduction in requirements.

In rolling mills the development of automatic gauge control for certain products and the use of preset adjustment of the roll spacings has not only speeded up output but reduced waste due to errors; it must always be borne in mind that all rejects of steel through defects of one kind or another have a very adverse and substantial effect on the overall fuel economy.

By such means as have been outlined, the steel industry has effected substantial overall improvements in the fuel economy of its operations. Still further improvements may be expected.

New PTFE Insulated Instrument Wire

An addition to the range of PTFE insulated instrument wire announced by A.E.I. Radio & Electronic Components Division, London, W.C.2, is classified as Type A. It joins type B introduced last year, and conforms to Ministry of Aviation Specification EL 1930, Issue 3. Basically for use in instruments and equipment, the new version is of particular interest to aircraft manufacturers. Applications are expected to be widespread, however, throughout the aircraft, electronic, and chemical industries. The wire is recommended for use at voltages up to 350 r.m.s. and where conductor temperatures of between −75 deg. C. and 250 deg. C. are experienced.

Defects in
LARGE CASTINGS AND FORGINGS
Their Significance to Designers

As it is almost impossible to obtain a large casting or forging without some minor defect, it is necessary in the case of highly stressed components for large turbo-electric generating plant and other heavy equipment, including large castings or forgings, to decide to what extent small inclusions, voids, and other discontinuities can be tolerated. The matter was discussed by F. Buckley, B.Sc. (English Electric Company, Limited), in a well illustrated contribution to the recent symposium on "Internal Steel Quality and Methods of its Assessment," arranged by the West of Scotland Iron and Steel Institute. Abridged extracts from the paper are given below.

DESIGNERS of plant here envisaged have some knowledge of the inconsistency of steel masses and also of possible weakness caused by cavities and inclusions, allowances being made for these in any overall factor of safety. The establishment of the latter is dependent also on previous experience, but, due to the dynamic nature of design trends, this is of limited application. Thus, for example, in the field of steam turbine prime movers, whereas 15 years ago sets of a maximum size of 30,000 kW. with steam temperatures of around 430 deg. C. were being produced, there are now single units up to about 500,000 kW., steam temperature up to about 600 deg. C., and pressures in excess of the critical value.

A similar story could be told of practically every other branch of engineering. Not only are larger components being used, but steels of vastly improved character as regards strength and high-temperature characteristics are also being employed. Past experiences, therefore, are only of limited value and have to be applied with great care. In addition to these developments as regards performance, new detection methods have become available which clearly demonstrate the imperfect character of steel products previously regarded as sound, and while there may be some satisfaction in knowing the best or worst of a forging or casting, the responsibility for deciding the suitability for acceptance of a component for critical and arduous duty can be very onerous.

Detailed Study

To illustrate the problems and difficulties confronting the users the author makes a detailed study of castings and forgings used in prime mover manufacture. These are representative of the highest skill of the forgemaster and foundryman, and collaboration between the users and producers has led to rigorous standards of inspection and acceptance. Further, the quality and range of the products are typical of those used in a wide range of engineering fields, ranging from high-speed high-temperature gashed rotors common to steam-turbine practice to the heavy low-speed shafts and other components used in water turbines. The emphasis in every instance is on reliability, as any failure of either a casting or forging, particularly if associated with a rotating part, may involve a high risk to human life and heavy financial loss. An outline is given, therefore, of the acceptance standards applied to these important products and the type of defects that are acceptable. It should be emphasized that although these standards are high and have only been attained after long, and in some instances bitter, experiences by the manufacturing establishments, yet to the credit of all concerned, castings and forgings of the requisite standards are being regularly produced at the present time.

CASTINGS

Dealing first with the important castings for steam-turbine practices these are mainly the casings which house the rotor and the housing, for the valves which control and govern the steam. The main requirements in every instance are stability and freedom from distortion under long-term high-temperature loading, coupled with ability to prevent cracking due to thermal fatigue effects. These conditions are ensured as far as possible by correct composition, heat treatment, and, most important of all, careful design of the component. In addition, the castings must be free from any defects which could act as sources of weakness in service.

Acceptance of the castings, therefore, includes careful inspection at the founder's works in which case magnetic crack detection and acid pickling play an important part. The latter is particularly effective in revealing hot tears at changes of section, these being completely removed and rectified by welding. Radiography is mostly confined to selected areas, outlet zones for welded connections and regions of particular importance to the founder,

in which case satisfactory radiographs are expected and usually obtained. The word "satisfactory" is used in preference to "clear" as applied to the radiographs as there are standards beyond which it is unnecessary to proceed. Isolated blowholes, for example, the repair of which may involve extensive probing, metal removal and a weld size completely out of proportion to the original defect can usually be quite safely ignored.

Secondary Shrinkage

Extensive radiographic examination of castings of this type, particularly those involving considerable complexity of design, invariably shows a considerable amount of secondary shrinkage, the main feature being capillaries at the centre of the sections involved, which always present a problem as regards acceptance. They can be so fine in nature and so widespread that any question of complete removal becomes almost impossible. Further, being essentially a liquid shrinkage problem they are associated with changes of section where comprehensive radiography is almost impossible and as such a detailed assessment of the full extent is difficult.

The degree of secondary shrinkage permissible, therefore, becomes one of the most difficult problems regarding acceptance, and the following points influence the final decision:—(1) Location in relation to critical area of stress; (2) location in relation to possibility of thermal stress effects; (3) nature of secondary shrinkage, that is, whether truly central, and degree of concentration.

It can be stated that no case has ever been observed where secondary shrinkage has given trouble in service. Many failures have occurred in service which have been concerned with undetected tears at changes of sections which, under the effect of repeated heating and cooling, have developed into major cracks. The shrinkage on cooling of liquid steel is 1.6 per cent. per 100 deg. C. and on solidification a further contraction of 3.05 per cent. of volume is experienced, which places a formidable burden on the foundryman in securing true progressive solidification. The solution as applied to large highly-stressed castings appears again to rest with the designer, in constructing a relatively simple component which allows the pattern of solidification to be accurately forecast. Further, it is advantageous to break down complicated shapes and cast the parts separately, welding them together subsequently. The cast/weld construction has been brought to a high pitch of perfection particularly in steam chests.

No mention of castings is complete without reference to the water-turbine runners which involve heavy dynamic loading, in particular the complicated integral cast Pelton bucket wheels, which are normally required in 12 per cent. chromium steel. Here the most important thing is freedom from cracks at the roots of the bucket, which calls for the most careful attention in these areas. It can be mentioned that one specialist foundry concerned with the manufacture of this type of casting has installed betatron equipment for the investigation of critical areas.

FORGINGS

Forgings include rotating members, which, being subjected to the most stringent conditions of stress and temperature, demand the maximum employment of non-destructive testing devices and intelligent skill in the interpretation of the results. In this respect a full knowledge of the service duties influences the necessary decisions. The standards of acceptance for high-speed high-temperature solid steam-turbine rotors would not allow the type of defect permissible in a low-speed bulky water-turbine shaft. Again, surface conditions are most critical in components such as diesel crankshafts, in which bending stresses are at a maximum on the surface, particularly at the junction of webs and journals.

Turning to the main forgings associated with steam-turbine practice, there are various types of rotors most of which are solid forgings of the barrel or gashed types, while others are built up of separate discs shrunk on a central spindle. The requirements are briefly, sufficient strength and stiffness, in particular for long-term application at elevated temperatures, which, in turn, is ensured by correct attention to composition and heat treatment. Further essential features include the capacity to remain dead true at speed and working temperature which implies precise, uniform heat treatment, and, in addition, freedom from internal defects that can act as crack starters and so lead to premature failure. Guarantee of the latter condition constitutes the most outstanding problem at the acceptance stage and ultrasonic investigation is utilized extensively.

Prior to the wide adoption of the latter type of inspection the internal characteristics of the forgings were judged mainly from the bore examination, and this, in general practice, is still retained, there being only isolated instances of manufacturers who have eradicated the bore and rely entirely on the ultrasonic inspection as a judge of internal quality coupled with specialized radial test-piece examination from selected areas.

Aspects of Bore Defects

The following aspects of bore defects are worthy of mention:—(*a*) The rejection of a shaft in the past judged on the basis of a bore defect was influenced undoubtedly by the fact that the visual indication was considered a pointer to the probability of further defects beneath the surface. This unknown factor can be eliminated to a large extent by the intelligent and skilled application of ultrasonic inspection. (*b*) Boroscopic examination is more discerning than ultrasonic inspection. The latter would probably ignore minor defects of a size which under the magnification of the optical instrument would appear significant. (*c*) In shaft extensions the more troublesome features are the silicate inclusions from the base of the ingot which may show up in the bore and which can persist to the outside of the forging. Providing these are

small in individual size and not too numerous, small bore inclusions, well outside the main barrel portion of the shaft and close to the bearing area, are not regarded as harmful.

Bore inspection, therefore, should always take into account the auxiliary ultrasonic indications and while the standard of the bore in the main barrel portion of the shaft must remain high, small scattered inclusions of the silicate type in extensions are not regarded as serious.

Hairline Cracks and Cavities

Turning to the main body of the shaft, the predominant fear is the presence of hairline cracks or cavities which, remaining undetected in the body of the forging, might act as stress-raisers and crack-starters during service. An additional hazard is that of inefficient hydrogen removal with accompanying danger of reduced ductility of the steel and, therefore, of easier crack propagation.

Great interest was taken in the failure of some American rotors a few years ago in which case fracture commenced at locations of hairline cracks. One of the results of the vast amount of development work carried out in the United States as a result of these mishaps is a suggestion regarding standards of acceptance based on ultrasonic inspection, the so-called Rankin and Moriarty chart.

Although considerable interest has been shown in this chart, which, incidentally, is mentioned in some American turbine specifications, so far as can be ascertained no forgemaster or turbine builder in the UK uses it as the main criterion for acceptance or rejection of a steam-turbine shaft forging. More attention is paid to the cumulative effects of the size of defects, their number and position, the differences between ultrasonic indications at various testing frequencies and the difference between the ultrasonic trace obtained on high and low sensitivity settings. These factors are reviewed initially by the forgemaster in the light of his knowledge of the manufacturing procedure including heat treatment, and an assessment is made as to whether the defects are inclusions or cracks.

In certain instances a full knowledge of the thermal history of the forging is necessary to enable a reliable interpretation of the ultrasonic tests to be made.

Identification of Inclusions

The identification of hairline cracks as opposed to inclusions is outside the scope of this paper, but it can be mentioned that considerable suspicion automatically falls on defects corresponding to the position of the A segregates, as compared to similar indications from the bottom of the ingot. However, the standards for all these types of forgings are unanimous in rejecting a rotor which is suspected of containing cracks and, therefore, the user's prime consideration is given to the significance of non-metallic inclusions.

The maximum size of inclusions that are generally permitted corresponds to a 10-mm. flaw echo when examined at a frequency of 2 Mc/s with little or no reduction in the height of the back echo. This size of flaw would be equivalent to one returned from a flat-bottomed hole between $\frac{1}{4}$ and $\frac{3}{8}$ in. dia., depending on the distance of the defect below the testing surface. The decision to accept a shaft with a defect of such a size would have to be closely related to the working stresses in the vicinity of the defect and also the orientation of the defect. Smaller defects than these could also lead to the rejection of a component if present in large numbers or concentrated in regions of high stress. Very small inclusions, which are present to some extent in all steel forgings, that give an ultrasonic indication less than that obtained from a $\frac{1}{4}$-in. dia. flat-bottomed hole are usually ignored.

American and British Shaft Forgings Compared

When one studies the ultrasonic reports obtained from defective shaft forgings that failed in America it is obvious that there were a far greater number of defects and that the sizes of the defects were far larger than those found in shafts offered to users in this country. Individual defects were found in these rotors giving a response greater than the signal obtained from a $\frac{1}{4}$-in. dia. flat-bottomed hole and there were innumerable defects compared to $\frac{1}{4}$ in. size.

In one low-pressure spindle failure, the sonic tests had disclosed an area in the main body giving responses 100 per cent. of the back reflection, although the bore which was claimed to be sound had been increased from 8 to 16 in. dia. Defects of the type noted during the subsequent investigations would have accounted for the partial or complete loss of back echo in the original inspection which automatically would be sufficient reason for rejecting shaft forgings in this country no matter which frequency, sensitivity, or technique of testing was employed.

Problem of Transition Temperature

These costly and tragic American experiences are the most revealing destructive tests there are, and have been supplemented by further disc-bursting tests. In this series of investigations, miniature discs were taken from the unsatisfactory rotors and compared with ductile material possessing low transition temperature impact properties tested under the same conditions. The maximum difference was noted in the case of bored discs containing a notch in the bore in which instance the ductile material had a ratio of bursting strength to tensile strength of 0.57, while the brittle material gave an equivalent ratio of only 0.29. Examination of a large number of discs taken from many rotors showed a definite trend in reduction of bursting stress as the impact transition temperature increased.

All users and forgemasters are concerned with this problem of transition temperature and considerable research is proceeding on the problem of controlling this factor. Certain turbo-generator builders have included an empirical value in specifications and have even, in certain circumstances,

insisted on preheating of generator shafts prior to the application of normal service stresses. The practical significance of this work is reflected, of course, in the acceptance of defects on alternator rotors in which event loading can occur at temperatures below or in the vicinity of the transition temperature.

Some indications have been given, therefore, of the standards applied to these most important forgings. These of necessity are high and it is difficult to see how any reduction can be made without further extensive destructive testing in which case significant defect sizes in relation to mass size could be studied. In this respect it should be mentioned that each manufacturer has the dilemma of rotors and forgings that have been in service for a great number of years and which would be unacceptable by modern standards. Many instances have occurred where turbine rotors and discs have been re-examined by ultrasonic methods after life periods of 20 years and which could not be accepted on the basis of this inspection at the present time. In these instances it is assumed that the forgings have proved their fitness for service on the basis of experience and usually no modifications are made.

Conclusion

In conclusion, the user must of necessity heartily welcome and embrace any new testing techniques which enable him to ascertain the internal conditions of both castings and forgings. Intelligently used and co-ordinated to previous experiences the employment of these additional agencies need not automatically imply increased rejection rates. Indeed, it should be possible to eliminate to a large extent the factor of ignorance which in the past has resulted in many scrapped forgings and castings.

The important critical duties to which these components are applicable obviously make the acceptance standards high and it is only by the further application of large-scale destructive tests such as bursting disc tests, in which event critical defect sizes can be closely studied, that any relaxation can be made.

In this respect it would be interesting to compare the relative effects of design features that involve stress concentrations against natural occurrences such as non-metallic inclusions and even hairline cracks. On the other hand, steelmakers and forgemasters are constantly demonstrating that the regular attainment of the necessary standards can be accomplished and with the wider application of such additional processes as vacuum casting, the designer and user can look ahead with reasonable confidence to the new important developments that depend so much on the reliability of these products.

Commercial Production of High-Purity Metals

VERY pure arsenic, antimony, tellurium, and bismuth are now being produced by Johnson, Matthey & Company, Limited, London, E.C.1, on a commercial scale. By means of newly developed techniques, arsenic is being produced with an impurity level of the order of 1 p.p.m., detected by use of present known and accepted spectrographic methods. The element is in the form of crystalline lumps and is packed in vacuum-sealed glass tubes.

Antimony, with a maximum metallic impurity content of 5 p.p.m., and bismuth, with a maximum level of metallic impurities of 10 p.p.m., are being produced in ingot form. Zone-refined tellurium, with a metallic impurity content of the order of 1 p.p.m., is also available in bulk, in the forms of ingot or grain.

Of increasing importance to the semi-conductor industry, these four high-purity metals find growing application in the form of inter-metallic compounds. Gallium arsenide, for example, is used in the production of special diodes and transistors, indium antimonide and indium arsenide are used for magneto-sensitive devices, and bismuth telluride is used in Peltier cooling units.

THE HALMSTAD IRONWORKS, in Sweden, manufacturers of reinforcement steel and other ferrous products, is benefiting from the recent development of Halmstad as a deep-water harbour. The 600,000 cu. yd. of sand and clay dredged from the harbour basin has been used to reclaim land which the works needed for its expansion.

RUST PROOFING IRON AND STEEL

DETAILS of a new coating for rust proofing iron and steel are announced by Metalife Liquid Metals, Limited, Harrogate (Yorks). Metalife Duplex metal coating is a two-pack system consisting of a base and a solidifier which, when combined, give a metal coating having exceptional resistance to corrosion, abrasion, solvents, and chemicals. It withstands temperatures from −65 deg. F. to 400 deg. F. dry heat and is non-toxic.

A one-brushed application is claimed to give a double thickness coating. The coating is quick drying and can be overcoated in 6 hr. Two-brushed coats of Metalife Duplex deposit 2.1 oz. of anodic metals per sq. ft., equivalent to good-quality galvanizing. The new product has been tested under severe laboratory and site conditions.

Price Structure of Coal

A FOURTH edition of "Coal: the Price Structure" has been published by the Federation of British Industries. The booklet first appeared in 1952 and has been brought up to date from time to time as price changes have been introduced by the National Coal Board. In addition to giving prices of industrial grades, the booklet contains useful notes outlining the basis of the price structure.

The booklet is available from FBI Print & Publications, 21, Tothill Street, London, S.W.1 (price 2s. 6d., post free).

SURVEYORS AT BANGOR

Annual Conference of the RICS

EDUCATION was the theme of last week's annual conference of the Royal Institution of Chartered Surveyors, held at the University College of Bangor. The mining section of the RICS was well represented at the conference, and Mr. F. G. Glossop, production director of the North-Western Divisional Coal Board, speaking at its annual luncheon, said although much of the glamour had gone from mining surveying, standards of accuracy had improved. The future of mining surveying lay in increased efficiency and, in conjunction with planning engineers, in better layouts of underground workings.

Sir John Wolfenden, in the principal address to the annual conference on August 31, said the young at present were enjoying all the advantages of a seller's market. This could well be a contributing factor to all the restlessness, the arrogance, and even the lawlessness of the rising generation, he said.

Commenting on the Report of the Special (Review of Educational Policy) Committee of the RICS, Sir John agreed with the view that the standard of entrants to the surveying profession should be progressively raised, but he was not certain how this could best be done.

Training of Mining Surveyors

Coal mining had exerted an exaggerated influence on the education and training of mining surveyors, said Mr. K. Wardell in an address, prepared by himself and Prof. E. L. J. Potts, on Saturday.

They suggested that the syllabus for the examinations of the RICS should be revised to cover the whole field of metalliferous and non-metalliferous mine surveying in which coal mining would play a significant but not overwhelming part. Most coal-mining surveyors in this country had little perception of the problems and difficulties in physical surveying or of the representation of information on maps, plans, and sections where the mineral deposits lay at relatively high inclinations and had to be worked with different systems and techniques of mining.

The authors continued: "If, as in the last 15 years, many more people of minimal ability and ambition are encouraged into mining surveying and are persuaded that the statutory certificate is the hallmark of the professional surveyor, the profession will continue in its gradual loss of status and esteem, both in industry and in relation to other similar professions."

The splitting of the work of senior mine surveyors within the coal-mining industry into two or three distinct departments had not been of any benefit to the profession generally, they said. The narrowing of the field of work had lessened the production of men of originality and imagination.

Mining surveying existed as a separate profession in almost every European country except Great Britain. That it did not do so in the great mineral producing countries of the Commonwealth was a criticism of the failure to produce a professional surveyor of wide education and outlook whose worth and status would be universally recognized.

"We believe there is no argument against the submission that the National and Higher National Certificate and the Mining Qualifications Board Examination are at the level of the technician rather than the technologist," they said. "Indeed it could hardly be otherwise, since the very purpose of the statutory qualification is to ensure safety through the production of practical surveyors who will know the law relating to safety provisions and who will be able to apply existing proved techniques to guarantee those requirements."

Full-time academic training at universities or colleges of advanced technology was essential, they thought, to the attainment of the requisite level of professionalism. The professional status of surveyors in Germany and Holland was greatly enhanced by the fact that mine surveying was considered sufficient of a discipline to merit chairs in mine surveying at the technical universities, and in many European countries the title "mining surveyor" was applied exclusively to those who had undergone the most rigorous training and education; the sub-professional level being described as "survey-technician," "surveying deputy," or "surveying overman."

Wrong in Principle

They considered that the Royal Institution of Chartered Surveyors' present policy of trying to graft something professional on to a basic education and training which was largely sub-professional was wrong in principle. It was inevitable that what they were advocating would ultimately lead to a division between professional and sub-professional surveyors, but this, in fact, already existed in practice and had done more to depreciate the worth and importance of mining surveying as a profession than any other single factor.

They suggested that future entrants to the profession should be from the sixth forms of secondary schools and should proceed to full-time courses of study for a minimum of three years

either at a university or an appropriate college. This should be followed by two years of approved practical training during which time each candidate should be expected to make a special study of some aspect of his work and present a thesis or dissertation before qualifying for corporate membership of the institution.

Those who had left school before reaching the sixth form should proceed to the Higher National Certificate in Mine Surveying, having obtained the necessary standard at GCE Ordinary Level, and thereby qualify for entrance to the professional examinations.

In conclusion, Prof. Potts and Mr. Wardell put forward the following suggested outline syllabus for the mine surveying section examinations of the RICS:—

First Examination: Mathematics; materials and structures; geology; theory of surveying and surveying instruments; principles of economics.

Intermediate Examination: Mathematics (II); mining geology; mine surveying; mining technology; mining economics.

Final Examination: Mining; mining economics (II); mine surveying (II); mineral exploration and applied geophysics; mining law.

Mobile Elevating, Screening, and Stocking Plant

SENIOR engineers of the National Coal Board were at Moorgreen Colliery, Eastwood (Notts), recently for a demonstration of a mobile elevating, screening, and stocking plant by Michael & Partners, Limited, Chesterfield. Those present included Mr. T. Wright, Area general manager, No. 5 Area, East Midlands Divisional Coal Board, at whose request the plant was developed.

The machine, which is known as a Loadascreen, was demonstrated in use as a stockpiler. Lorries discharged coal into the Loadascreen's apron hopper at ground level, and a 30-in. wide belt, running on 50-ft. centres, lifted the coal to a 48-in. by 96-in. double-deck vibrating screen. In this case, however, the top screening cloth was replaced by a solid plate so that the screen acted as a vibratory conveyor. The coal then passed down a fishtailed chute to the stockpile.

The design of the Loadascreen enables coal to be stockpiled to a height of 18 ft. with negligible degradation. The apron hopper has rubber flaps at the back to seal against lorry sides and bottoms, the adjustable drop fingers at the front to control the flow of the coal up the conveyor. The coal falls less than 9 in. from the conveyor head to the vibrating screen and a strip of belting has been fitted to slow down the material as it passes over the screen. The boom elevation, the discharge chute angle, and the rear caster wheels are hydraulically controlled from a cab which, in the marketed model, will be totally enclosed by sheet-metal walls with perspex opening windows fore and aft.

The machine is mounted on a pair of swivelling road wheels so that from one position of the hopper the machine can stockpile in an arc with a radius 64 ft., laying down a stock of coal 120 ft. wide.

The conveyor of the prototype demonstrated was powered by a 15-h.p. squirrel cage, totally enclosed and weatherproof electric motor and the hydraulics were operated by a 7½-h.p. electric motor. The Loadascreen can be powered alternatively by diesel engines.

Apart from stickpiling, the machine can be used for loading road or rail vehicles. In this case, a three-way discharge chute is fitted to the vibrating screen so that three grades of coal can be loaded into three vehicles at one time. Screen cloths will be supplied according to requirements.

The Loadascreen is manufactured by Frederick Parker & Company, Limited, Leicester, to the design of Michael & Partners, which is handling the sales.

NCB OFFICIALS INSPECTING THE PROTOTYPE LOADASCREEN BEING USED TO STOCKPILE COAL DELIVERED BY LORRIES TO THE STOCKPILING AREA AT MOORGREEN COLLIERY. THE PILE IN THE FOREGROUND WAS BLINDED WITH SLACK BEFORE THE DEMONSTRATION. THE PILE ON THE LEFT INDICATES MINIMUM DEGRADATION.

NEW INSET AND PIT-BOTTOM CIRCUIT

at Steetley Colliery

COMPLEX haulage arrangements at Steetley Colliery, in No. 1 (Worksop) Area of the North-Eastern Divisional Coal Board, have necessitated the construction of a new shaft inset and pit-bottom circuit. In October, 1957, the Cementation Company, Limited, London, S.E.11, was asked by the National Coal Board to undertake this work.

Coal was being transported from the faces by conveyor belts in the district gates and then on to a main conveyor which delivered the coal to a pit-bottom loading station down a 1 in 4 drift. Any materials for the coal faces had to travel the same route. This circuit was being used because the pit bottom was 100 yd. deeper than the workings. When the new inset and pit bottom had been completed, it became possible to wind directly from the horizon at which the coal was being worked.

Factors Affecting the Work

Since colliery output had to be maintained, the contractors were told that they would not be able to work in the shaft except for short periods. Another factor which affected the work was that no dirt could be handled during the coal production shifts, since the dirt would have to travel the same circuit as the coal. Therefore, it was necessary to evolve a system which would permit the construction of the roadways and the inset without affecting the colliery production. To overcome these problems, it was decided to work only two shifts per day. On the dayshift the drifting faces were drilled and fired, and supports set with temporary lagging. On the nightshift the drifts were cleaned out and the supports lagged. To enable work to proceed on inset construction, circular steel plates were fitted in the shaft throughout the inset length, and excavation carried out from behind them after the access roadways had been driven.

Work commenced early in 1958 by starting to drive a main 16-ft. by 12-ft. roadway from the top of a 1 in 4 drift. This roadway was to form part of the new pit-bottom circuit. The agreed system of work was put into operation, and after everyone concerned understood the cycle, was found to work quite well. The dirt could be handled on the nightshift, and adequate time was available for drilling the faces and setting supports. However, it was found that should anything occur which caused a long delay, such as a major breakdown on the trunk conveying system, difficulty was experienced in getting the work back to cycle.

The drifting continued at a steady rate until the point was reached when it became necessary to install the circular plates in the shaft. Since it was known that the plate fixing would take a certain time, it was decided to install them during the weekends when the shaft was idle.

The method of fixing the plates in the shaft was simple, but very effective. The depth of the inset was established by measurement and marked on the shaft wall. Extension flaps were then fitted to the cages to provide a platform from which the men could work, and holes drilled into the shaft wall at the measured depth of the inset. Steel dowels were inserted into the holes and the first ring of plates placed on them. The plates were designed in rings 2 ft. 6 in. high and had eight segments per ring. When the first ring had been placed and levelled, further rings were built, until 35 ft. of plates was suspended in the shaft. In order to provide sufficient anchorage, safety chains were fitted to the top ring of plates and anchored into the wall by another ring of dowels.

When all the plates were in

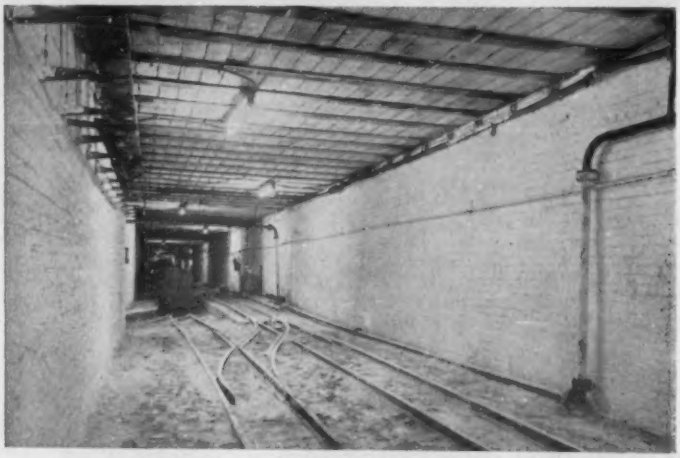


FIG. 1.—SECTION OF ROADWAY IN THE NEW PIT BOTTOM AT STEETLEY COLLIERY.

position, a pilot heading was started and taken to within 10 ft. of the shaft. This heading was then enlarged in stages to the final excavation size, roof girders set and the brick sidewalls built. This method of construction was continued until the inset was within 10 ft. of the shaft, when it was necessary to suspend shotfiring in order not to disturb the plates. The remaining 10 ft. of excavation was completed using pneumatic picks only.

After completion of the full side of the inset, access to the other side of the shaft was gained by driving a loop roadway supported by 11-ft. by 9-ft. steel arches. It was then possible to drive back from the pump house junction, and so complete the second side of the inset, employing a similar method to that used on the first side. The actual breakthrough to the shaft was again done without shotfiring so as not to disturb the steel plates.

Before stripping the plates from the shaft, the ground was allowed to settle and the brickwork regularly examined. When it was apparent that there would be no appreciable ground movement the plates were stripped, again when the shaft was idle so as not to impede production.

When the inset had been completed, a temporary winding landing was established to give better access to the workings at this level. Work then continued driving the remaining pit-bottom roadways (Fig. 1) which were mostly of 16-ft. by 12-ft. finished size supported by straight steel joists on legs and slabbed.

It is interesting to note, that although the inset was completed by working towards the shaft, as against the more conventional method of working away from it, all the work had been completed to the intended centre line. Also, despite the involved dirt disposal system, full production was maintained throughout the whole of the work.

With the finished scheme Lofco creeper units only are used for marshalling the full and empty cars from the loading point to the cage. The work is now practically complete, the original objects having been achieved with a remarkable degree of success. It is worthy of note that in spite of the surveying problems in directing the works so as to line up accurately with the existing shaft, no difficulties were encountered.

Indian Iron & Steel

A dividend of 15 per cent., subject to tax, for the year ended March 31, 1960, has been announced by the Indian Iron & Steel Company, Limited. The company's actual output of saleable steel in 1959-60 was 661,000 tons, against 497,000 tons in 1958-59. The expansion programme of the company will be substantially completed by the end of this year.

Invitation to Industry

Attractive sites for works at Cardiff and Barry docks are available. Details of the larger sites are given in a brochure, copies of which may be obtained from Mr. W. Jeffers, chief docks manager, British Transport Commission, South Wales Docks, Pierhead Building, Cardiff Docks. Mr. Jeffers will also be pleased to supply information on the smaller sites available.

Stone Dust Barriers in Mines

DRAFT general regulations which it is proposed to make under Section 141 and 143 of the Mines and Quarries Act, 1954, have been issued by the Ministry of Power. The regulations, which amend the Coal Mines (Precautions Against Inflammable Dust) Regulations, 1956, require the provision of stone dust barriers in certain coal conveyor roads. They have been discussed with representatives of owners, officials, and workmen, and it is intended to bring them into operation on October 1.

The regulations are being made in pursuance of the recommendation of the report on the explosion at Walton Colliery (Yorks) on April 22, 1959, that it should be made obligatory to provide stone dust barriers on coal conveyor roads underground.

The manager of every coal mine is required by the regulations to consider the area or areas throughout which flame from an ignition of gas or dust at a working coal face might reasonably be expected to extend, and, if there is within that area a roadway conveyor or conveyors, not less than 50 yd. long, used for conveying coal other than anthracite, then the regulations require the manager to provide stone dust barriers within that area. The intention is that the manager should provide a sufficient number of barriers, and so place those barriers, as to limit as far as practicable the effects of any coal dust explosion occurring on any coal conveyor road in the vicinity of a working coal face. The position and type of barrier must be defined in a scheme drawn up by the manager, and barriers must be provided in accordance with the scheme.

If the manager considers that an ignition might occur at some place other than a working coal face—for example, at the face of a heading—and that the effects of this ignition might extend to a coal conveyor road, then the manager may determine that other place for the purposes of Regulation 10A(1)(*b*). If he does so he is required to provide additional stone dust barriers at such places as he may specify in his scheme.

The regulations provide that barriers must be of a type approved by the Minister. The specifications of the types of barrier approved will be published from time to time. The initial approval will include approval of barriers conforming to the specification laid down in the National Coal Board directive dated September 1, 1953. The regulations require that the manager's scheme or a copy thereof shall be kept at the office at the mine (or another place approved by an inspector).

An inspector may by notice require a manager to amend a scheme made under these regulations. Any such notice may be subject to reference.

The regulations will not apply to mines licensed under Section 36(2)(*a*) of the Coal Industry Nationalization Act, 1946, until April 1, 1961.

HIGH-SPEED COAL-SHIPPING PLANTS AT IMMINGHAM

TWO new coal-shipping plants, each capable of automatically unloading coal from railway wagons and transferring it to a ship's hold at a rate of up to 1,350 tons an hour, have been installed by British Transport Docks at Immingham (Lincs). They were designed and constructed by Mitchell Engineering, Limited, Peterborough, in conjunction with the British Transport Commission's dock engineers.

Both appliances can handle 55 wagons of coal an hour, the tonnage varying with the size of the wagons, which range from 10 to 24½ tons capacity. In a recent trial one plant shipped a cargo of 17,500 tons of washed small coal from small-capacity wagons aboard the Norwegian bulk cargo vessel, m.v. Providence, in the record time of 29½ hr. at an average rate of 600 tons an hour.

The new plants are electrically operated and each consists of a combined wagon haulage and tippling device connected by belt conveyor to a 100-ft. loading tower on the quayside. The wagon-handling unit hauls loaded wagons from the foot of the plant and places them on a wagon tippler at the top of an inclined gantry, shown in the accompanying illustration. The contents of the wagons are emptied into a hopper and fed to a conveyor belt. The coal is then transported by the belt to the loading tower and on to an adjustable loading boom for discharging into ships' holds.

The tower structure housing the boom, which is telescopic and can be raised and lowered, is mounted on a radial rail track. By a combination of all movements the boom can be adjusted to reach every part of a ship's hold to ensure even distribution of the coal. As a wagon is emptied it is pushed off the tippler by the following loaded wagon. The empty wagon is allowed to run down the track on the other side of the gantry and up a "kick-back," or rising ramp, until it stops. The wagon then runs back over switch points and gravitates to the empty wagon-storage sidings.

THE INCLINED GANTRY AND WAGON TIPPLER. WAGONS ARE MECHANICALLY HAULED TO THE TOP OF THE GANTRY AND PLACED ON THE TIPPLER. AS A WAGON IS EMPTIED IT IS PUSHED OFF THE TIPPLER BY THE FOLLOWING WAGON.

Two Operators

Each plant is designed to be worked by two operators. One controls the wagon haulage and tippler plants and the other, housed in the tower, controls all other operations. The operators are in telephonic communication with each other and with the wagon marshalling staff who control the movement of wagons from the dock reception sidings to the front of the inclined gantry. Once set in motion the plants work entirely automatically until stopped, and all movements in each plant are overlapped so that a continuous flow of coal is maintained without loss of time.

The two appliances are situated 400 ft. apart on the South Quay at Immingham Docks.

New Oil-processing Plant in Poland

WORK has started on the construction at Plock, in Poland, of an oil-processing plant, to be completed in 1965, with an initial annual capacity of 2,000,000 tons of crude oil, increasing to 6,000,000 tons as from 1968. It will also produce some 400,000 tons annually of chemicals and chemical products.

The plant is part of a scheme agreed upon between Poland, eastern Germany, Czechoslovakia, Hungary, and the Soviet Union for the development of industries based on crude oil, pumped from Russia along a long-distance pipeline to be completed in 1963. The Polish section of the pipeline will be 420 miles in length, and will have six pumping stations along it.

New Patents

PATENTS below are among the complete specifications accepted listed in the Official Journal (Patents). The numbers given are those under which the specifications have been printed and all subseqent proceedings will be taken.

Applications for copies of the full specifications (3s. 6d. each, post free) should be made to the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.2.

Mining and Mining Appliances

840,681 General Electric Company, Limited. Braking systems for mine winders.
840,051 Hoy & Company, Limited, Austin. Coal-cutter chains.
840,517 Halifax Tool Company, Limited. Apparatus for grinding or sharpening rock drills, bits, or like tools.
840,481 Soc. Technique pour L'Industrie Miniere. Hoisting and discharging installations employing trucks with tipping tubs.
840,159 Mine Safety Appliances Company, Limited. Combustible gas-testing apparatus.
841,036 Protector Lamp & Lighting Company, Limited. Safety lamps.
841,000 Kirkpatrick, M. B. Tunnelling or mining machines.

Metallurgy and Engineering

836,681 Hüttenwerk Oberhausen A.G. Process for refining iron in a rotary drum furnace.
836,967 Baldwin - Lima - Hamilton Corporation. Billet containers for metal extrusion presses.
837,867 Ajax Engineering Corporation. Method of casting molten metal and a furnace for carrying out the method.
837,807 Alexandrovsky, G. Treatment of pig-iron and apparatus therefor.
837,489 United Engineering & Foundry Company. Apparatus for coiling hot-metal rods and cooling same.
837,781 Steel Company of Wales, Limited. Steel manufacture.
837,587 Heraeus G.m.b.H., W. C. Methods for degasifying molten metals under vacuum.
837,932 Deutsche Gold und-Silber Scheideanstalt Vorm. Roessler. Process for carburizing and carbonitriding iron and steel.
837,740 Schenck Maschinenfabrik G.m.b.H., C. Method of controlling an ore-sintering plant.
837,539 Arbed Acieries Reunies de Burbach-Eich-Dudelange S.A. Pneumatic refining of metals.
838,212 Hanmade Conveyor Company, Limited. Roller mountings for conveyors.
838,294 United Steel Companies, Limited. Chromium-nickel-manganese steel.
838,520 Fichera A.B. Ladle device for use in casting metals.
838,534 Genders, R., and Kemmish, W. B. Manufacture of alloy steels and articles produced therefrom.
838,503 Dortmund-Hörder Hüttenunion A.G. Process for refining steel.
838,997 United Kingdom Atomic Energy Authority. Processes for purifying metals.
838,658 Coppee Company (Great Britain), Limited. Method for the manufacture of ammonium sulphate.
838,396 Moeller & Neumann G.m.b.H. Rolling mill stands.
838,830 Imperial Chemical Industries, Limited. Apparatus and process for rolling metal.
838,611 Wiggin & Company, Limited. Henry. Forging of metal articles.
838,613 Soc. D'Electro-Chimie, D'Electro-Metallurgie et des Acieries Electriques D'Ugine. Iron-base alloys.
838,147 Dortmund - Hörder - Hüttenunion A.G. Methods of reducing iron ores.
838,676 Foundry Services, Limited. Hot tops used in the casting of metals.
838,960 Lukens Steel Company. High-strength alloy steel for structural and pressure vessel uses.
838,005 Union Carbide Corporation. Reduction of the sulphur content of ferrous metals.
838,263 Heraeus G.m.b.H., W. C. Methods of continuously melting metal and electric-arc vacuum furnaces for use therein.
838,185 Didier-Werke A.G. Apparatus for exhausting charging gas in coke-oven batteries.
838,870 Klöckner-Hüttenwerk Haspe A.G. Apparatus for aggregating fine ores by roasting and sintering electrically.
839,752 Sutcliffe, Richard, Limited, Streets, H., and Bottomley, E. Conveyor belts.
839,709 Birlec, Limited. Induction heating of metal billets and like workpieces.
839,063 Fagersta Bruks A.B. Steel for welding or cold working.
839,926 Jünkerather Gewerkschaft. Process for chilling the surfaces of castings in the mould.
839,815 Inter-Continentaler Huttenbaü Anstalt für Beratung, Planung und bau von Stahl- und Metallindustrien. Rolls for rolling mills.
840,721 Turton Platts & Company, Limited, G., and Fitzjohn, A. P. Apparatus for retarding or arresting the progress of rail vehicles.
840,422 Holman Bros., Limited. Dust-extraction systems for rotary abrasive tools.
840,632 Kuzela, J., and Vavrin, F. Device for the production of pumiceous material from blast-furnace, boiler, and other slag.
840,045 Klöckner-Humboldt-Deutz A.G. Roller briquetting press for briquetting ores, coal, or similar substances.
840,242 Klöckner-Werke A.G. Method of preparing preliminary metal or steel from pig-iron containing phosphorus.
840,498 British Iron and Steel Research Association (Centre National de Recherches Metallurgiques). Installation for the continuous casting of a molten metal.
840,608 Svenska Kullagerfabriken A.B. Vacuum casting of metal ingots.
840,612 Tiroler Rohren- und Metallwerke A.G. Method of surface hardening cast iron.
841,152 Diamond Alkali Company. Treatment of molten metals.
840,803 Elektrometallurgie G.m.b.H. für, und Starcke A.G., H. C. Method of producing manganese of high purity.
840,811 Union Carbide Corporation (formerly Union Carbide & Carbon Corporation). Process for refining pig-iron.
841,065 Smith & Company (Possil), Limited, H., and Jeffrey, D. C. Process and apparatus for straightening metal plates by rolling.

841,163 SIMON, LIMITED, HENRY. Pneumatic conveyors and the like for powdered and granular materials.
840,940 LANCEY, K. A. Attachment of swivel connection members to wire ropes and the like.
841,399 STRACHAN & HENSHAW, LIMITED. Wagon arresting means.
841,176 DEMAG-ELEKTROMETALLURGIE G.M.B.H. Electric melting furnaces.
841,496 MOELLER & NEUMANN G.M.B.H. Rolling mills.
841,091 MOELLER & NEUMANN G.M.B.H. Rolling mills.
840,992 SENDZIMIR, T. Long-cycle continuous annealing of strip metal.
840,835 KLÖCKNER-GEORGSMARIENWERKE A.G. Method and device for the rapid attachment and release of roll housings, doffing rolls, or other machines mounted on sole plates.
841,350 PINTSCH BAMAG A.G. Continuous feeding of additions to rotatable metallurgical converters.

Fuel Treatment and Utilization

840,669 KOHLENSCHEIDUNGS-G.M.B.H. Method of operating coal-dust combustion apparatus and apparatus therefor.
840,043 ROCHLING'SCHE EISEN- UND STAHL-WERKE G.M.B.H., and STILL, K. F. [trading as STILL, C. (firm of)]. Re-treatment of coal mixtures, especially those rich in gas, unsuitable for normal bulk handling and their introduction into a coke-oven battery for the production of blast-furnace coke.
840,566 OETIKER, H. Arrangement for controlling the operation of a coking plant.
840,699 SUMITOMO CHEMICAL COMPANY, LIMITED. Method of gasifying pulverized coal in vortex.
840,700 SUMITOMO CHEMICAL COMPANY, LIMITED. Method of gasifying pulverized coal.

Book Review

Textbook of Metallurgy. By A. R. Bailey. Second edition. Macmillan & Company, Limited, St. Martin's Street, London, W.C.2. 30s.

UNTIL the first edition of Dr. Bailey's "Textbook of Metallurgy" appeared in 1954, British students and their teachers of metallurgy were in a quandary when searching for a suitable textbook in which they could find help and guidance. If the selection was confined to reasonably priced British books, the specialized monographs of Hume Rothery, the general textbooks of engineering metallurgy, *e.g.*, Rollason, the out-of-date Desch, or the tautologies of Carpenter and Robertson, were all that could be found. American textbooks were of a patchy quality and one can say without being chauvinistic that they were rarely suitable—the question of their use of deg. F. instead of deg. C. and the quoting of strengths in lb./sq. in. were further points of disadvantage.

Dr. Bailey's book set out to provide "a modern and thorough introduction to physical and process metallurgy at universities and technical colleges," and appeared to succeed. It immediately became popular with lecturers and found its way on to the book lists of all establishments of metallurgical education. Now, six years later, a second edition has appeared with extensive revision of the sections dealing with crystallization, plastic deformation, the dislocation theory, creep and powder metallurgy.

Major additions include accounts of developments in the extraction of zinc, uranium, titanium, and in iron and steel making processes. The reading lists at the end of each chapter and the number of equilibrium diagrams reproduced have been increased. Finally, an appendix based on the author's monograph for the Institution of Metallurgists on the writing of metallurgical reports has been included. Changes in metallurgical theory and practice in recent years have received due recognition. In brief, we have the *vademecum* of the student who wishes to pass examinations and a detailed summary of the basis of modern metallurgical theory and practice.

The book's good points are:—(*a*) It will help the conscientious student; (*b*) it is well written and illustrated with line diagrams; and (*c*) at a price of 30s. metallurgists will endorse the claims of a member of the publisher's family that they "have never had it so good." On the debit side it is felt that as the book is written for British metallurgists that the amount of space devoted to extraction metallurgy, approximately 40 per cent., is over-generous when the references to topics, such as alloy steels welding, surface coatings, T-T-T curves, and case hardening, are either dismissed in a page or so or ignored.

These chapters on extraction metallurgy are in themselves excellent. They expound the modern physico-chemical approach of the theory of the subject followed by a concise account of modern practice. It is a pity, however, that the method of treatment was not applied to subjects no less important than extraction processes and ore dressing. Unfortunately, the empirical approach persists in several chapters; for example, a section dealing with fuels and refractories does not mention heat transfer. Throughout, the approach is qualitative and descriptive rather than quantitative.

This criticism will be valid or not according to whether one views the vast field of metallurgical activity from an examination hall of London University or from engineering and metallurgical establishments of the Midlands. Even so, the general approach of this textbook reveals a defect in our national metallurgical armour and should force all practising metallurgists to ask—are our young metallurgists being taught the right things in the right way? One hears whispers that the examination syllabuses of the Institution of Metallurgists are being drastically revised. Has this news reached ears of textbook authors? The planning of textbooks is an activity in which our professional institutions should take a lead.

In short, let us congratulate Dr. Bailey on his indefatigable erudition and recommend that all students and works' libraries—*faute de mieux*—possess a copy. His book is undoubtedly the best that has come our way for many years. Perhaps when the syllabuses of metallurgical examinations allow, he will bring out an even better book.

A. HOPKINS.

JAPANESE CONSULTANTS have been engaged by the Pakistan Industrial Development Corporation to carry out a survey for the establishment of a steel plant in East Pakistan.

US Coke Output Increased Despite Steel Strike

COKE production in the United States in 1959 totalled 55,863,572 tons and was 4 per cent. over the 1958 output of 53,604,102 tons. It was, however, 30 per cent. less than the record output of 1951, according to the Bureau of Mines, US Department of the Interior. Production of oven coke last year was 54,789,276 tons, against 53,005,730 tons in 1958, while the figures for beehive coke were 1,074,296 (598,372) tons.

Last year's increase over 1958 was achieved in spite of a 116-day strike in the iron and steel industry, which caused nearly all of the furnace coke-oven plants to bank their ovens or operate them at greatly reduced rates. Coke-oven plants operated at a high rate through June and production at furnace plants averaged 91 per cent. of capacity, while merchant plants averaged 70 per cent.

Post-strike Activity

The steel strike, beginning on July 14, drastically reduced coke output and furnace plants operated at only 21 per cent. of capacity until the settlement of the strike on November 7. The tremendous drop in requirements of blast-furnace coke reduced purchases from merchant plants, and the rate of production of merchant plants for the July-November period averaged about 60 per cent. of capacity. Coke production rose rapidly following the end of the strike and, by the end of the month, furnace plants were operating at about 80 per cent. of capacity, while merchant plants increased their operating rate about 10 points. In December, production rates continued to climb; by the end of the year furnace plants were producing at about 90 per cent. of capacity and merchant plants reached 73 per cent., the highest production rate since February, 1959, for this group. Slot-type ovens supplied 98 per cent. of the coke produced in 1959.

Production of beehive coke in 1959 nearly doubled the 1958 output, mainly because of the strong demand for blast-furnace fuel during the first six months. Beehive production did not react after the strike as did oven coke and the December, 1959, production was only 76 per cent. of the monthly average output for the first six months. One of the factors that hampered beehive production in December was the large stocks of oven coke that accumulated at many of the furnace plants during the strike. Stocks of coke at furnaces nearly doubled between June 30 and November 30, while stocks at merchant plants rose more than 500,000 tons, or 40 per cent. during the same period. An all-time peak, slightly above 5,000,000 tons, was established in November. This large reserve of coke, particularly at furnace plants, cut down the need for beehive coke.

The apparent consumption of coke for all purposes in the US in 1959 rose 4 per cent. over the 1958 total, but was 23,425,820 tons, or 30 per cent., below the record high in 1951. As in preceding years, blast furnaces consumed 89 per cent. of the national coke consumption, iron and steel foundries 5 per cent., producer- and water-gas manufacture less than 1 per cent., other industrial uses (nonferrous smelting, chemical processing, rock wool manufacture, etc.) 4 per cent., residential heating 1 per cent., and 1 per cent. was exported. The quantities used in metallurgical applications (blast furnace and foundry) and for other industrial purposes increased, whereas less was used to manufacture gas and for residential heating.

Production of coke screenings or breeze increased 2 per cent. in 1959 over 1958. Until recent years this material was used almost exclusively as a power-plant fuel, but in recent years outlets for breeze have changed, principally because of the increased demand for agglomerating iron ore and smelting phosphate rock. In 1959, only 32 per cent. of the breeze output was used for raising steam, 26 per cent. in agglomerating plants at iron and steel works, and 38 per cent. used or sold for miscellaneous industrial applications, including the manufacture of elemental phosphorus. The increased demand for breeze stimulated prices and the average value per ton of breeze sold in 1959 was 98 per cent. higher than the 1947-49 period. Most of the breeze used in phosphate furnaces in the western states and in Florida was shipped by rail over great distances, which added considerably to the delivered price of breeze at such installations.

Dispute Hits Naphthalene

Although slot-type ovens carbonized 1,907,081 more tons of coal in 1959 than in 1958, production of ammonia, tar, and light oil decreased, while gas output increased. The output of these basic chemical raw materials was held down because the yields of all of these products were lower than in 1958. The decrease in output of the basic chemical products also reduced production of the principal derivatives of tar, light oil, and ammonia. There was only limited production of coal chemicals during the steel strike. The strike did not cause any shortages of tar and light oil products, such as creosote oil, benzene, toluene, and xylene, but supplies of naphthalene became critical. Unlike benzene, toluene, and xylene, which were produced in large volume by the petroleum industry, the sole source of naphthalene supply was from coal carbonization in the US and abroad. Imports of crude naphthalene from European countries averaged over 90,000,000 lb. for the years 1955-58 and totalled 59,000,000 lb. in 1959.

The total value of coal carbonized was slightly more than $779,000,000 in 1959. The value of all coal-chemical materials used and/or sold, and coke and breeze produced amounted to $1,300,000,000, or 68 per cent. more than the value of the coal. The value of coke and breeze amounted to nearly 78 per cent. of the value of all products, while coal-chemical materials, including surplus gas, made up the balance.

IRON AND STEEL TRADE

BIG demand for plates is featured in the spate of orders which is likely to keep every section of the iron and steel industry working at top pressure for the rest of the year. Difficulties caused by slackness in demand from the shipyards has been more than counterbalanced by orders from the building and constructional engineering concerns and from the manufacturers of heavy industrial plant and equipment. Structural steel orders are sufficient to keep the rolling mills fully occupied and outputs of crude steel and pig-iron, reflecting the calls of the finishing trades, are reaching record levels.

Pig-iron

Outputs of pig-iron in all grades are more than sufficient to satisfy present demands and extra tonnages are available should they be required. Production of basic pig-iron is also maintained at high levels and in sufficient quantities to meet the requirements of the steelworks. Increased tonnages of imported scrap have relieved the situation to some extent, but the steelworks still rely mainly on basic pig-iron.

Pressure for supplies of low phosphorus, hematite, and some refined irons is easing in some parts of the country but the engineering and speciality foundries continue to take up substantial tonnages.

Ferro-alloys

The slight increase in ferro-tungsten activity is maintained, and ferro-molybdenum is in fair request. A steady demand exists for supplies of ferro-vanadium, and both the high and low carbon grades of ferro-chrome are receiving moderate support. Interest in ferro-silicon would appear to be reverting to the high pre-holiday level. Calcium silicide is fairly active, and the call on ferro-manganese and silico-manganese is at a good level.

Ferro-niobium is active, and interest in ferro-titanium is maintained. In more specialized directions there is a fair demand for both ferro-phosphorus and ferro-sulphide.

Semi-finished Steel

There is no slackening in the call for small bars, light sections, and reinforcing rods, but the scarcity of suitable labour continues to restrict outputs. If this difficulty could be overcome outputs could match up to the demands of work on hand.

Plentiful supplies of mild steel billets are held by most of the re-rollers, and home steelworks have sufficient additional supplies if needed. The re-rollers requiring carbon and special quality steels are, however, not so well provided for.

Finished Steel

With most steelworks booked to the end of the year for the more popular sizes of sections and joists, approved quantities can still be placed for certain sizes where mills are short of rolling quantities. Plates of all descriptions are heavily booked for forward rolling, especially the lighter thicknesses, but orders can still be placed for some of the heavier types for rolling.

The motor industry especially continues to make heavy demands on the supply of cold reduced sheets, so much so that smaller consumers are having to resort to getting supplies from the US and the Continent. Both flat and corrugated galvanized sheets are in fair demand, but there are still no signs of any appreciable improvement in hot rolled black sheets and strip.

Double Century for Carblox Blast Furnace Linings

AUGUST orders received by Carblox, Limited, Loxley, near Sheffield, included the 200th for Carblox blast-furnace linings since the first of such orders was received in 1943. The company, which is a member of the Marshall Refractories group, claims that this constitutes one of the largest totals of any carbon manufacturer. It is exclusive of many orders for Carblox used in iron runner troughs and for patchings, etc.

The order was for a blast furnace in a South Wales iron and steel works, but Carblox bricks and corrugated blocks have been supplied to countries all over the world—from Australia to Finland, and from the Argentine to Hungary.

Carblox carbon linings were developed to overcome the weaknesses of normal ceramic refractories which are attacked by molten iron and slag and which disintegrate in the stack owing to the carbon deposition in the brickwork. In early experiments it was found that in the hearth ordinary sized bricks tended to float and the Carblox corrugated block was designed.

Other applications of the lining in metallurgy are cupolas, lead furnaces, non-ferrous blast furnaces, slag melting, electric and ferro-silicon furnaces, and Bessemer converters, and it is also used extensively in the chemical and allied industries.

Fletcher Houston Acquisition

ALL the £14,750 issued capital of Harringtons (Engineers), Limited, of Kingswinford (Staffs), a private company trading as general engineers, has been acquired for £5,000 by Fletcher Houston & Company, Limited, founders of high duty alloy and grey iron castings, of Tipton (Staffs). Harringtons, it is stated, made a heavy loss last year owing to exceptional circumstances.

At April 30 last, the assets at book value exceeded the liabilities by £2,388, although the directors are satisfied that the value of the assets is in excess of the book figure as they consider the freehold premises and plant to be worth considerably more than their book valuation. It also appears from preliminary figures available to July 31 that the losses have been arrested, and the assets acquired should therefore be of considerable value to the group.

BRITISH JEFFREY-DIAMOND, LIMITED, is exhibiting mining machinery at the International Trade Fair to be held at Brno, Czechoslovakia, from September 11 to 25.

Coalfield News

March of 500 Miners Against Manager

NEARLY 500 miners from Denaby Main Colliery (Yorks) marched through Doncaster on Thursday last week to the headquarters of the North-Eastern Divisional Coal Board to present a petition demanding the dismissal of the colliery manager. The march was the outcome of a strike which began the previous day. The manager whose dismissal the men demand is Mr. Hugh Desmond McTighe, who, they say, snubbed a miner, Mr. John Crossland, by referring to him as "coloured."

Mr. McTighe, who has apologised to Mr. Crossland, says that a remark he made was cut off in the middle of a sentence and gave an erroneous impression. The petition was presented at the Coal Board offices by Mr. William Gibson, chairman of the Denaby branch of the NUM, and received by Mr. W. H. Sales, chairman of the North-Eastern Division, who will meet the two men concerned. Normal working at the pit was resumed on Monday.

DURHAM DIVISIONAL COAL BOARD is to erect a medical centre at Dawdon Colliery, Seaham.

AFTER spending all his working life at Wingate Colliery (Co. Durham), Mr. Ralph Watson retired on Saturday at the age of 65.

FOLLOWING an accident at Rose Heyworth Colliery (Mon), Mr. Reginald Jones (46), a miner, died in Blaina and District Hospital.

NO OBJECTION is to be made by Chesterfield Rural Council to two more National Coal Board stockpiling sites at Holbrook, near Halfway (Derbyshire). The land to be used is close to local collieries.

NINE of 10 Northumberland NCB brickworks men who sat for the recent City and Guilds Examination gained the kiln burner's certificate. This is the highest percentage of passes recorded in any NCB Division.

HOUSING SCHEME, involving the building of 460 new houses on three sites, is now under way for miners working at the new Bevercotes Colliery (Notts). Most of the building is expected to be finished by the end of 1961.

THREE BARNSLEY MINERS who state that they were asked to leave a miners' convalescent home at Scalby, near Scarborough, two days early because they were two minutes late returning to the home at night, are to appeal to their branch of the NUM.

MINER who was suspended from holding office by the National Union of Mineworkers, Mr. Arthur Owen, has appealed against the ban. He was suspended from the Brodsworth Colliery committee following an investigation into his report that coal-cutting equipment at the pit was dangerous.

OUTPUT of the West Midlands Divisional Coal Board in the four weeks ended August 27 was 710,000 tons—9.97 per cent. less than in the corresponding period of last year. Manpower on August 27, at 44,000, was 8,300 less than a year ago and 5,600 less than in January of this year.

NEW WINDING gear at Creswell Colliery (Derbyshire) has developed "unexpected characteristics" which affect the electricity supply to Creswell itself, causing lights to dim, cookers to cool off, and television sets to fade. The power supply to the colliery is to be isolated from the main system.

MINER at Silverwood Colliery, Rotherham, Mr. W. Cawley (45), was rescued by workmates when trapped by a fall of roof three quarters of a mile underground last Saturday. He was treated by the pit ambulance service, and was discharged from hospital a few hours after the mishap with slight injuries.

MODEL DRIFT mine is being sunk in the back garden of his Ilkeston (Derbyshire) home by an ex-miner, Mr. R. Huthwaite (36), who left the industry five years ago through ill-health. Large enough for him to crawl down, it will have a conveyor belt, wagons and signalling equipment worked by two electric motors.

AFTER 52 years of driving for the Ashington Coal Company, Limited, and the National Coal Board, during which he has travelled over 500,000 miles, Mr. William Campbell has retired. He received a presentation on behalf of his colleagues at Ashington Colliery from Mr. C. N. Whitaker, secretary of the Northern Northumberland Area of the Northern (N&C) Divisional Coal Board.

FORMAL VERDICT was returned at the inquiry at Kirkcaldy Sheriff Court on Mr. Richard Long (24), who died in an accident at Seafield Colliery (Fife). Mr. Long, a miner, had just finished coupling the compressed air leads to a digger machine when the bucket of the machine dropped and crushed him against a girder, it was stated. Witnesses testified that a metal retaining rod attached to the bucket was loose.

DELEGATION of miners from Six Bells Colliery (Mon) recently returned from a two weeks' visit to Czechoslovakia as the guests of the Czechoslovakian Miners' Union. During the visit the delegates' coach was involved in a collision in which a motor cyclist fractured a leg. Mr. Thomas Williams, a colliery ambulance man for 20 years, attended to the injury and was later complimented by Czech doctors.

COAL AND COKE shipments from the South Wales ports last week totalled 52,573 tons, 7,416 tons higher than the previous week, but 888 tons less than the corresponding week of 1959. Tonnages shipped from the various ports (with 1959 tonnages in parentheses) are as follow: Newport, 3,471 (14,161); Cardiff, 12,915 (13,338); Penarth, 2,744 (2,864); Barry, 9,320 (4,224); Port Talbot, 821 (2,226); Swansea, 23,302 (16,608).

AFTER 55 years in the mining industry, the past 22 of which he has been miners' checkweighman at Mauchline Colliery (Ayrshire), Provost John Murray (66) has retired. He was employed by the men themselves as "justiceman," and received a presentation from the miners of a retirement gratuity. He started in the pits at 13, worked underground as a miner in many local collieries, and spent the last 30 years of his service at Mauchline Colliery.

WORKMAN at the Rising Sun Colliery (Northumberland), Mr. G. Dalgarno, was rescued in record time by fellow workers after being pinned under a fall of stone nearly a mile below surface, breaking his back. The rescuers, who brought him up within an hour of the fall, were praised for their efforts by management and union officials. Specially mentioned were Mr. R. Coulson (overman), Mr. T. Wilby (deputy), Mr. W. Brooks (cutterman) and Mr. V. Metcalf (caunchman).

CONSIDERABLE DAMAGE was done to one of the wagon tippers at the new coal preparation plant at Wellesley Colliery (Fife), when a line of wagons got out of control and crashed through the automatic stop into the tipper. A spokesman said that the cost of repairs could not at present be estimated but it was thought the tipper would be out of action for two or three weeks. The plant is continuing working on one tipper with a re-arrangement of shifts to cope with the input to the plant.

THE COAL TRADE

GENERAL tightening up in market conditions is proof that the halcyon days of summer are over (if they ever began) so far as the coal trade is concerned. From most districts comes news of increasing pressure for domestic supplies, especially the better qualities, and the slight and very short respite in the insatiable demand for anthracite is a thing of the past for another year. Another regular and reliable pointer to the upward trend of the market is the interest in fuels for central heating. Consumers are at long last building up stocks and merchants are doing their best to meet the sudden surge of ordering.

DERBYSHIRE

The improvement in domestic demand is maintained, and full delivery of all contract tonnages is being sought by merchants. Best coals are keenly sought, and greater tonnages could be disposed of. The better types of screened cobbles and brights are actively sought, and full delivery of contract tonnages is being requested. Cheaper brights are still very popular, but there are insufficient supplies to meet the current demand. Best large nuts are one more being sold without difficulty, and all available despatches can now be absorbed against current orders. Washed medium and small nuts are in good demand and supplies are fairly good.

Inquiry for gas coke nuts shows an increase, but deliveries are well maintained. There is a similar improvement in the demand for premium smokeless fuels, all of which are available, although delivery delays are becoming apparent in some instances. There are more inquiries for domestic anthracites, and a steady increase in the delay in obtaining them, particularly with reference to the better grades, is being felt. Small anthracite consumers are able to obtain a steady flow of supplies where distributors maintain reserve stocks, but the supply position is tighter than for some time. Demand for "Phurnacite" is fairly steady, and there is some delay in the rate of despatches being sent out from works. Most consumers are however receiving regular supplies.

There is a steady interest in most industrial coals and, as colliery holidays are virtually over, there is a gradual improvement in the overall availability of coals. Nutty deep-mined slacks are fairly promptly available. Dry screened nuts are in firm request, and forwardings are on a satisfactory scale. A gradual revival of interest in washed coals for central heating purposes is now apparent, with several consumers taking in stocks in readiness, but there is an increase in the delays at certain local colliery landsales. A steady rate of inquiry for hard steam coals is being met by satisfactory deliveries in most instances.

There is some improvement in the rate of industrial inquiry for gas and hard cokes, and although despatches are a little slower, supplies on the whole are moving forward reasonably well.

SOUTH-WEST LANCASHIRE

The improved demand for house coals continues and merchants are receiving a steadily increasing number of orders for all grades. Because of the colliery holidays some allocations are in arrear but the Coal Board is making available additional tonnages of other qualities to meet the deficiency. "Coalite" continues to maintain a good market with steadily increasing demand and so far an adequate supply. Supplies of anthracite stove nuts are already becoming difficult and the Coal Board has told traders that no further orders can be accepted for grades 1A and 1B—the two most popular qualities.

In the gas coke market there is no material improvement in the domestic and central heating demand. Industrial demand for all cokes, together with other steam raising qualities, remains steady and a good service is being given both by road and rail transport.

Coastwise shipments of domestic and industrial fuels from the Merseyside docks continue much as in recent months with a steady flow of shipments to Northern Ireland and the Isle of Man.

The following are the average prices, per ton, of house coals now in force: Group 1, 182s. 8d.; Group 2, 163s. 3d.; Group 3, 146s. 5d.; Group 4, 134s. 8d.; Group 5, 121s. 7d.; Group 6, 111s. 5d.; Group 7, 97s.

Miner Banned From Holding Union Office

MINER employed at Desford Colliery (Leics), Mr. Martin Ryan (39), has been banned from holding any office in the National Union of Mineworkers for two years. Mr. Ryan has been secretary of No. 2 lodge of the union at Desford Colliery for the past seven years. His suspension has been imposed by the Area executive, a special committee of the Leicestershire Miners' Council, and he has a right of appeal up to national executive level.

Mr. Ryan has complained that his suspension came closely after the publication of a letter he wrote to The Guardian criticizing the Leicestershire branch of the union and alleging that the methods by which matters were brought before the annual conference at Llandudno were undemocratic. Mr. Frank Smith, the Leicestershire NUM secretary, said he could not comment on the suspension as it was subject to appeal.

BID FOR SOUTH WITBANK COAL IS OPPOSED

DIRECTORS of South Witbank Coal Mines, Limited, have advised shareholders not to accept the offer made by Tavistock & Uitspan Collieries, Limited, to acquire the issued share capital of the company. They mention the "vastly improved position" of the company, and point out that coal sales for the last six months were 425,696 tons against 280,410 tons for the same period of last year. The estimated gross profit for the same period was £103,735 as against £34,190.

Tavistock & Uitspan is offering three 5s. shares for every five 10s. shares in South Witbank. In the event of the offer being accepted, it intends to rationalize the administration and sales of the two companies.

Board Changes

Managing Director of PD Technical Services Resigns

MANAGING director of POWELL DUFFRYN TECHNICAL SERVICES, LIMITED, Mr. D. G. Hemmant, has tendered his resignation. He is at present seconded from the company for a year to be acting director of the British Mining Equipment Export Association. He will not be returning to Powell Duffryn after the expiration of that appointment.

Mr. R. Turner, who has acted as managing director during Mr. Hemmant's absence, has been appointed sole managing director of the company.

COPPERAD, LIMITED—Mr. L. J. Eames has been appointed a director.

MULLARD EQUIPMENT, LIMITED—Mr. F. S. Barton has joined the board.

ALUMINIUM CORPORATION, LIMITED—Mr. P. R. McGhee has resigned from the board.

HENRY BALFOUR & COMPANY, LIMITED—Mr. J. B. Hamilton-Meikle has resigned from the board.

S. GUITERMAN & COMPANY, LIMITED—Mr. J. Rosenthal has resigned from the board and as secretary.

ASQUITH MACHINE TOOL CORPORATION, LIMITED—Mr. W. G. Hunt and Mr. A. D. George have been appointed directors.

CLAYTON DEWANDRE COMPANY, LIMITED—Mr. S. J. Barnes, director and general manager, has been appointed managing director.

CHANCE BROS., LIMITED—Dr. W. M. Hampton is retiring this month as managing director He is succeeded by Mr. C. J. S. Newman.

ASSOCIATED CHEMICAL COMPANIES, LIMITED—Mr. A. Henderson has been appointed deputy chairman and Mr. W. F. Dunnett has joined the board.

RALEIGH INDUSTRIES, LIMITED—Mr. C. Gilbert Smith, who was appointed to the board of Raleigh Cycle Company, Limited, last May to take charge of the motor division, has joined the board.

HADFIELDS FOUNDRY & ENGINEERING COMPANY, LIMITED—Mr. Arthur W. Gurney, local director and chief cost accountant of Hadfields, Limited, the parent company, has joined the board.

VICKERS-ARMSTRONGS (ENGINEERS), LIMITED—Lt.-Cmdr. R. B. Lakin has been appointed a director, and general manager of the company's North-East works in succession to Mr. J. R. Kelly who is retiring.

COLVILLES, LIMITED—Mr. T. R. Craig has been appointed managing director (sales), and Mr. R. R. Towndrow, managing director (works). Sir Andrew McCance will continue as general managing director of the company.

CONSOLIDATED PNEUMATIC TOOL COMPANY, LIMITED—Mr. A. R. Jackson, general manager of the Australian branch since 1952, has been appointed to the board. He will continue in charge of operations in Australia, where he joined the company in 1927.

FOSTER WHEELER, LIMITED—Mr. C. E. H. Verity, managing director, has been elected a director of the parent company, Foster Wheeler Corporation, of New York. Mr. R. L. J. Hayden, Mr. C. J. Geiss, Mr. J. F. G. Arman, Mr. A. S. Bridgewater, and Mr J. McLean have been appointed to the board.

HAWKER SIDDELEY GROUP, LIMITED—Sir Roy Dobson, vice-chairman and managing director, has been appointed chairman of the subsidiary, Sir W. G. Armstrong Whitworth Aircraft, Limited. Mr. W. S. D. Lockwood has been appointed managing director of that company. Both appointments follow the retirement of Mr. H. M. Wodhams from the posts. Mr. Woodhams remains a member of the Armstrong Whitworth board.

ASSOCIATED ELECTRICAL INDUSTRIES (WOOLWICH), LIMITED—Mr. W. A. Ankerson has joined the board as assistant managing director. He will relinquish his appointment as general manager, AEI home district offices, and will cease to be a director of Associated Electrical Industries Overseas, Limited.

GOODYEAR TYRE & RUBBER COMPANY (GREAT BRITAIN), LIMITED—Mr. J. L. Mumby has been appointed financial director and secretary in succession to Mr. W. R. Booth, who has returned to the US as assistant treasurer of the parent Goodyear Tire & Rubber Company and treasurer of the subsidiary, Goodyear International Corporation.

Major Role for Steel in Booming Investment

CAPITAL investment by manufacturing industry in Britain throughout 1960 is expected to be considerably higher than was estimated earlier in the year. Board of Trade estimates, based on a sample of companies questioned during the summer, indicate that fixed capital expenditure by private industry and business in 1960 will be about 20 per cent. above the level of 1959—instead of about 16 per cent. as estimated at the start of the year. In manufacturing industry alone the increase may be as much as 25 per cent. Upward revisions to earlier forecasts have been made by companies in the iron and steel, motor vehicle, and other major industries.

The same companies have also given estimates of their expected expenditure on capital account in 1961. While the figures are only provisional, they reinforce the impression of a strongly optimistic mood throughout British industry. Manufacturing industry is expected to spend about 20 per cent. more in 1961 than in 1960.

A significant contribution to investment developments is being made by the steel industry, which has been hard pressed to meet the demand even for its heavier products, and many of its expansion schemes have been added to. Capital spending in the industry may reach a peak of £150,000,000 in 1961, when the building of the new strip mills in Scotland and South Wales will be in full swing. This compares with about £100,000,000 in 1959 and an expected £125,000,000 in 1960.

Murex to Spend over £1,000,000 in Two Years

EXPANSION programme at the Rainham and Waltham Cross works of Murex, Limited, over the next two years is likely to exceed the annual average of £500,000 in the last few years, Sir Arthur Smout, the chairman, states. Present indications are, he says, that this can be met out of current resources, as was the £480,000 capital expenditure for the year ended April 30, 1960.

During the current year, demand for all the company's products continued at a high level, and while it might be too much to expect that the exceptional 1959-60 results would be repeated, Sir Arthur was confident that prospects were good.

COMPANY NEWS

BRITISH STEEL PILING COMPANY (HOLDINGS), LIMITED—Unchanged final dividend of 10 per cent., makes 12½ (15) per cent. for 1959. Group profit fell from £39,659 to £27,540, after tax of £26,665 (£44,774).

BILSTON FOUNDRIES, LIMITED—The offer of Allied Ironfounders, Limited, to acquire the company has been accepted by the holders of more than 90 per cent. of the capital and has now been declared unconditional. Further acceptances will be received.

KEELAVITE HYDRAULICS, LIMITED—Group profit for the year ended April 30, 1960, was £114,799, compared with £109,549 previously and with an estimate of not less than £110,000 when the 6½ per cent. preference shares were marketed in May of this year.

SMITH & WELLSTOOD, LIMITED, ironfounders and makers of cooking and heating appliances, of Bonnybridge (Stirling)—Final dividend of 10 per cent. for the year ended June 30, 1960, makes 12½ (10) per cent. Group net profit rose from £69,310 to £80,996, after tax of £79,117 (£61,351).

EXPERT TOOL & CASE HARDENING COMPANY, LIMITED—Group loss was reduced from £58,221 to £43,567 in 1959. The preference dividend is again passed and is now in arrear from July 1, 1958. After various adjustments the debit forward is £31,633, compared with a previous credit of £10,774.

W. G. ALLEN & SONS (TIPTON), LIMITED—No ordinary dividend is to be paid for the year ended March 31, 1960, against a total of 15 per cent. for the previous year. There was a net loss of £31,670, compared with a net profit of £58,160, after tax credit of £13,340 (tax charge of £47,808).

PYRENE COMPANY, LIMITED—The company has purchased the business of S. F. Roberts, Limited, makers of breathing apparatus, fire protection apparatus, and various forms of industrial protection equipment, of London, S.W.15. The company acquired will in future be known as S. F. Roberts (1960), Limited.

ASH & LACY, LIMITED, sheet metal workers, of Birmingham—Dividend of 17½ per cent. is to be paid for the year ended June 30, 1960, compared with the forecast of 15 per cent. when the shares were marketed last November. Group net profit increased from £52,399 to £66,093, after tax of £69,455 (£48,893).

WILSON LATHES, LIMITED—Mr. John Richardson, chairman and managing director, states that the acceleration in trading conditions came too late to offset the effect of the serious depression experienced in the first six months of the year ended March 31, 1960. Net profit, after tax, was £9,308 (£2,715) and a final dividend of 25 per cent. makes 35 per cent. for the year.

GIBBONS (DUDLEY), LIMITED—The formal offer of 120s. per ordinary share has now been made by Wellington Tube Holdings, Limited. An offer of 40s. per share is also being made for the 7 per cent. (tax free) £1 preference shares, of which £30,000 have been issued. The directors recommend acceptance of the offers and intend to accept in respect of their own holdings.

HORSELEY BRIDGE & THOMAS PIGGOTT, LIMITED, constructional and plant engineers, etc., of Tipton (Staffs)—Although the future trend of business remains uncertain, Mr. J. V. Sheffield, the chairman, states that in recent months the order position has improved slightly. An agreement has been entered into with Union Tank Car Company, Limited, for the sale of part of the holding in Mechans, Limited. The foundry at Tipton has been closed, owing to lack or orders, and is now being used as a specialist transmission line tower shop.

BLICKVAC ENGINEERING, LIMITED, high vacuum, and precision engineers, of Jarrow (Co. Durham)—The liquidators' statement for the year ended June 24, 1960, shows total receipts of £14,036, less payments on account of £5,082 and total costs and charges of £844, leaving £8,110. Payments to creditors were £2,888 and cash at the bank is £5,222. It is expected that the liquidation will be completed within four months.

BROKEN HILL PROPRIETARY COMPANY, LIMITED—The fixed assets are to be revalued, after which a one-for-two scrip issue is to be made. The dividend next following the issue will be reduced to two thirds of what it otherwise would have been. The issue will be made after the November, 1960, dividend, which will therefore be unaffected. During 1961 it is likely that consideration will be given to further issues of shares for cash.

THORN ELECTRICAL INDUSTRIES, LIMITED—The board is considering what action should be taken following the defeat, largely by insurance companies, of the proposal to issue more "A" non-voting shares. Mr. Jules Thorn, the chairman, said he thought the insurance companies had made a "great mistake" in opposing the issue. The board's plan was to issue one ordinary for each ordinary held and one "A" share for each "A" share held.

UNIVERSAL GRINDING WHEEL COMPANY, LIMITED—The recent offer of one of the company's 5s. ordinary shares and 30s. cash for each of the 240,000 issued £1 shares of Luke & Spencer, Limited, has received over 90 per cent. acceptance and declared unconditional. Acceptance date has been extended to September 20. Luke & Spencer manufactures grinding wheels and other abrasive products in competition with the company.

PRINCE OF WALES DRY DOCK COMPANY SWANSEA, LIMITED—Mr. H. Barraclough, the chairman, is confident that conditions in the shipping industry must improve and that the company will reap some reward for contracting the new dry dock, which opened in June of last year. Group net loss of £1,197 was incurred in the year ended April 30, 1960, compared with a net profit of £19,198, and no dividend is to be paid, compared with 5 per cent. in 1959.

WESTON-EVANS (HOLDINGS), LIMITED—The capital of Thomas Bradford & Company, Limited, laundry engineers, of Salford (Lancs), has been acquired for a figure in the region of £80,000. The business, it is stated, fits in well with the Weston-Evans group, engineers associated with the paper making and textile industries. Apart from extending its range of products, the acquisition will provide the group with additional accommodation, plant, and labour to deal with expanding production.

HEPWORTH IRON COMPANY, LIMITED—Group profits for the year ended March 31, 1960, amount to £218,782 after taxation of £167,000. After deducting profits earned by subsidiaries prior to acquisition and minority interests, net profit attributable to members of the group is £180,619. A dividend for the year of 7½ per cent. is recommended. During the year it was decided, due to bad working conditions, to discontinue coal mining activities. For the past two or three years profits from these have been negligible, it is stated.

ENGLISH ELECTRIC COMPANY, LIMITED—An issue of

£7,000,000 6 per cent. debenture stock 1980-85 at £96½ per cent. is to be made to debenture, preference, and ordinary stockholders, registered on August 24. Lord Nelson of Stafford, the chairman, states that apart from normal growth, diversification calls for more capital. The point has now been reached where retained profits are inadequate to meet all capital expenditure and the group bank overdrafts stand at £22,000,000. The new issue will bring the aggregate annual gross debenture interest charge to £1,542,520.

PLESSEY COMPANY, LIMITED—A one-for-two rights issue of 5,400,000 10s. ordinary shares at 36s. a share is to be made. The issue is subject to approval of an increase in capital by 13,000,000 ordinary. Net proceeds of approximately £9,533,000 will provide funds for further development of the business, prospects for which are stated to be highly encouraging. Consolidated profits, before tax, for the year to June 30, 1960, are estimated to be about £4,300,000 against £2,236,119 for 1958-59, and a final of 8½ per cent. is forecast on the existing £5,400,000 ordinary, making 15½ (13 equivalent) per cent.

Support for TUC Action on Wildcat Strikes

DESPITE opposition from the National Union of Mineworkers and the Electrical Trades Union, delegates at the Trades Union Congress at Douglas, I.O.M., on Tuesday fell behind the general council's suggestion that disciplinary action should be taken against some unofficial strikers, and this section of the council's report was adopted.

Sir Thomas Williamson, of the TUC executive, said that 99 per cent. of the membership of the movement had abided by union rules. It was a very small minority which was being anarchic. He said that even since the report was completed, he had evidence of a meeting of stewards in a vital industry which took over the executive authority of five important unions. If executives of unions affiliated to congress were going to stand for that, the sooner they packed up the better, he said.

Mr. Harry Douglass (Iron and Steel Trades Confederation) said he had taken part in strikes but they were strikes to compel the employer to negotiate when he would not, or to compel him to observe agreements. If self-elected dictators attempted to destroy the agreements democratically negotiated they just as surely destroyed the movement which negotiated those agreements.

"The trade union movement today is an extremely powerful machine and it can only be driven by experts," said Mr. Douglass. "There are many people coming into the movement who view with some envy the power of the industrial machine we control. And how they would like to get their hands on the steering wheel and take it where they want to! But if any of these get their hands on the steering wheel who is going to decide where the vehicle is going to?" he asked.

An attempt to swing the miners into a both-way vote on the defence issue failed at a meeting of the miners' delegation on Monday. Mr. Abe Moffat, president of the Scottish Area of the NUM, tried to persuade his colleagues to vote both for the official policy and the TGWU unilateralist resolution. He received some support from South Wales delegates but was ruled out of order by Mr. Sidney Ford, NUM president.

MI Chairman Clarifies Expansion Plans

IN view of some misconceptions regarding the group's substantial capital expenditure programme, Sir Charles Westlake, chairman of Metal Industries, Limited, gave further details at the annual meeting on Tuesday. One of the factors which contributed to the strength of so diverse a group as Metal Industries, he said, was that they could direct their financial resources where they were most needed and where they were likely to show the best prospect of a profitable return.

"In several of our companies, plans for expansion and improvement of production facilities are in process of completion," he said. "This particularly applies to our electronic and hydraulic interests. These plans are substantial in relation to the companies concerned, but within the existing financial resources of the group." Sir Charles explained that he was referring only to the development of the group's existing companies. "The position might be changed if an opportunity were to emerge for a further enlargement of the group," he added.

The flow of orders and inquiries, particularly for the electrical companies, was continuing and steady progress was being made on the engineering and hydraulic sides.

Shipbuilding Sub-contractors Urged to Tighten Quotations

APPEAL to sub-contractors to the shipbuilding industry to prepare their quotations with the same spirit and resolve as the shipbuilders were applying to ensure that the industry would be truly competitive, was made by Dr. Denis Rebbeck, deputy managing director of Harland & Wolff, Limited, Belfast, on Tuesday. "I am firmly convinced that there is still some slack to be taken up. This is our life, our livelihood, and our future, and we must strive to secure it," he said.

Dr. Rebbeck said it would be folly to disguise the anxiety which existed because of the uncertain future for both shipping and shipbuilding. Both were subject to intense competition from abroad. On the one hand, too many ships were chasing too few cargoes, and on the other too many shipbuilders were chasing too few orders. There would have to be further economies in the shipbuilding industry to enable it to stand up to foreign competition. "We must improve output and efficiency, cost, and quality, and the effort must be sustained."

Mexican Twist Drill Project

THE International Finance Corporation (IFC) is to invest $280,000 in Acero Solar, SA, of Mexico, for an expansion chiefly for the manufacture of high speed twist drills. Acero Solar is a recently established business at present producing high and medium alloy steel bars, steel castings, forgings, and tool bits. Its plant is at Tlalnepantla, near Mexico City.

Virtually the entire domestic supply of twist drills is at present imported into Mexico. Acero Solar will be the only manufacturer of twist drills in the country and expects to supply a substantial portion of the market in the sizes it will produce. Total cost of the project is estimated to be $640,000.

NEWS IN BRIEF

THE Six Bells Colliery (Mon) Disaster Fund has reached £78,443.

LONDON telephone number of F. J. Edwards, Limited, is now EUSton 5000, and the company's Telex number is 24264.

LEEDS engineers, Speedex (Engineering), Limited, has been elected a member of Leeds Chamber of Commerce.

SITE in Chesterfield on which a new service centre is to be built has been acquired by Dowty Mining Equipment, Limited, Ashchurch (Glos).

AS FROM October 1, the address of Frew Bros. & Company, Limited, manufacturers of wire ropes, will be 27, Curtain Road, London, E.C.2 (telephone: BIShopsgate 3125).

BELGIAN steel concern, Soc. Anon. Cockerill-Ougrée, denied on Friday last rumours circulating on the Continent that it intended to raise its capital of 3,468,000 fcs. "in the course of this company year."

STEEL PRODUCTION in the US this week is estimated by the American Iron and Steel Institute at 1,441,000 tons, compared with 1,483,000 tons (revised) last week, and 327,000 tons in the corresponding week of last year.

RAILWAY SLEEPERS have been produced for the first time by the Durgapur Steelworks. The plant, built by Davy & United Engineering, Limited, was designed to produce sleepers for both broad and metre gauge railways.

WAGE INCREASE of 2½d. an hour for men and 1½d. an hour for women was agreed on Thursday of last week by the Chemical and Allied Industries' Joint Industrial Council. The increase is back-dated to August 14.

LECTURES are to be delivered by Mr. M. S. Bates, secretary of the North-Eastern Divisional Coal Board, and Mr. David I. King, of the United Steel Companies, Limited, to a conference of journalists at Harrogate in October.

ALL NEW PUBLIC BUILDINGS built in Monmouthshire are to be heated by coal, the County Council has decided. The decision followed a letter from the Minister of Power on the use and supply of coal for heating public buildings.

NEW THREE-STOREY building, costing £30,000, has been completed at the works of Frederick Parker, Limited, engineers, and quarry and gravel pit machinery manufacturers, of Leicester. It will provide extra space for drawing office and accounts staff.

WHILE attempting to release molten metal from a furnace at the Staveley Iron & Chemical Company, Limited, at Chesterfield on Sunday, Mr. Paul Cutts (41), a dumper driver, fell into a bell containing liquid metal. Workmates managed to get him out but he was dead when examined by a doctor a few moments later.

TWO NEW fabricating plants to produce corrugated aluminium sheet and ancillary rainwater goods have been established by Aluminium, Limited, in Jamaica and Trinidad. A new company incorporated in Jamaica —West Indies Aluminium Products, Limited—will be managed by Sprostons (Jamaica), Limited, an Aluminium subsidiary.

NEW AUSTRALIAN company has been formed by the Ruberoid Company, Limited, London, W.C.1, and the Colonial Sugar Refining Company, Limited, of Sydney. The new company, the Ruberoid Company of Australia, Proprietary, Limited, will manufacture roofings and bituminous building materials at a plant to be built at Altona, outside Melbourne.

RECORD RUN of 279 accident-free days established in September, 1958, by the steel division metallurgical department of the Steel Company of Wales, Limited, was equalled by the division's new work department in July this year. July was a good month throughout the whole division, only 29 accidents occurring—18 less than in June. The frequency rate for July was 1.09.

LACK OF SUPPORT has forced the organizers of Leicester's Knitting Machinery Exhibition to drop the idea. The show was planned as a protest against the moving of the International Knitting Machinery Exhibition to Belle Vue, Manchester, which was done because of insufficient stand room at Leicester. About 65,000 sq. ft. of space has been booked by 150 concerns for the Manchester exhibition in October, 1961.

FORTY EMPLOYEES of the Steel Company of Wales, Limited, recently received awards ranging from £50 to £2 for submitting useful suggestions aimed at either improving production, reducing costs, or improving safety and good housekeeping. Head of the list was Mr. L. Wright, mechanical foreman, 4-5 blast furnaces, who received £50 for an idea to improve the efficiency of the sinter screens at the No. 5 blast furnace.

THREE MEN were overcome by gas at the Stockport works of F. Bamford & Company, Limited, marine engineers, last week. One man dropped a tool down a pit used for covering long shafts and was overcome by fumes. Two workmen who went to his aid were also overcome. All three were rescued by firemen wearing breathing apparatus. The pit was empty and firemen believe that it may have been sewer gas since the pit is built on the site of an old tip.

DURING the first five months of the year Italian exports to the UK increased by 40 per cent. to £40,200,000. Italian imports from Britain also increased, but less markedly, to £37,500,000. The major increase in exports to this country was partly due to much larger supplies of motor scooters and motor cycles, rolled steel, machinery, petrol, and rubber products. British car exports to Italy rose by 300 per cent. to 2,000, while sales of tractors increased from 1,493 to 1,844.

Record Post War Steel Output in West Germany

PRODUCTION of crude steel in West Germany, including the Saar region, was 3,004,746 tons during August. This was the highest figure since the war, according to the Federal Bureau of Statistics. This compared with 2,956,471 tons in July and meant a daily average of 103,612 tons in 29 days against 103,736 tons in 28.5 days in July.

The total crude steel production of 29,435,000 tons last year is likely to be surpassed this year, the bureau added. In the first seven months of this year, production totalled 19,640,000 tons against 16,230,000 tons in the January to July period of last year.

Crude iron production in August reached a new high level for this year with 2,250,000 tons against 2,245,364 tons in July.

Orders Placed

£1,000,000 Blast Furnace for Colvilles

DESIGN, manufacture, and erection of a third blast furnace at the Ravenscraig works of Colvilles, Limited, is to be undertaken by Ashmore, Benson, Pease & Company, Limited, a member of the Davy-Ashmore, Limited, group. This company completed the first furnace at Ravenscraig in 1957 and is still working on the second. The latest contract is worth £1,000,000 and is scheduled for completion in October, 1962.

The new furnace will have a hearth diameter of 26 ft. and a slightly greater capacity over the other two. Apart from changes in the design of the brick lining and water cooling, it will be similar in all respects to the existing plants.

ADMIRALTY and Ministry of Aviation have ordered oscilloscopes, worth £250,000, from Solartron Laboratory Instruments, Limited, a subsidiary of the Solartron Electronic Group, Limited, Farnborough.

ALL the nuclear instrumentation for the advanced gas-cooled reactor of the UK Atomic Energy Authority at Windscale is to be supplied by Plessey Nucleonics, Limited, a subsidiary of the Plessey Company, Limited.

CARRIER transmission equipment for Murphy Radio, Limited, has been ordered from the transmission department of the telecommunications division of Associated Electrical Industries, Limited. The order is worth £130,000.

LATEST TYPE of preparation and ring spinning machinery has been ordered from Platt Bros. (Sales), Limited, a subsidiary of Stone-Platt Industries, Limited, by the Combined English Mills (Spinners), Limited, which is re-equipping its mills in Leigh.

THREE ORDERS from Africa and two from the Far East, to a total value of £250,000, have been placed with Aveling-Barford, Limited, Grantham (Lincs). The contracts call for 11 rollers, six diesel rollers, five 9-ton dumpers, and seven shuttle-dumpers.

CONTRACT for the insulation of two 1,400 Klb./hr. boilers built by Babcock & Wilcox, Limited, for the Central Electricity Board's West Thurrock power station, Grays (Essex), has been awarded to Versil, Limited, Liversedge (Yorks). The company specializes in fibre-glass insulation and the order is worth about £170,000.

CONSTRUCTION CONTRACT has been signed between the UK Atomic Energy Authority and Fairey Engineering, Limited, in connection with a new zero-energy oscillator reactor, which is to be built at the Atomic Energy Establishment, Winfrith. AEA has also signed a control gear design contract with H. M. Hobson, Limited, for the same project.

ORDER FOR 24 industrial trucks, worth £65,000 has been placed with Lansing Bagnall, Limited, materials handling equipment manufacturers, of Basingstoke, by Standard-Triumph International, Limited. The vehicles include 22 electric-powered reach trucks, each of two-ton capacity, and two towing tractors for tractor/trailer operations.

CONTRACT for the supply of a special non-ferrous aggregate, Diamond Betonac, to the factory being built at Basingstoke (Hants), for Lansing Bagnall, Limited, has been obtained by Quickset Water Sealers, Limited, a member of the Cementation Company, Limited, group. The aggregate, which is rustless and hard-wearing, is being used in the main manufacturing areas of the factory to withstand the abrasive action of wheeled trucking.

ORDER has been placed with R. Hoe & Crabtree, Limited, by The Times Publishing Company, Limited, for a 12-unit press to be installed in the new Times building. The press will be arranged to deliver a 48-page newspaper in double production from two folders; but larger copies of up to 64 pages are expected and three folders in single production will be used for these. Up to eight pages in full colour is possible with both sizes.

CLAIMED to be the first in Africa, the complete electrical equipment for a d.c. mine winder supplied from a grid-controlled mercury-arc converter has been commissioned by Gold Fields of South Africa, Limited, from the heavy plant division of Associated Electrical Industries, Limited. The winder operates in a 3,800-ft. long shaft at an angle of 34 deg. to the horizontal and is driven by an AEI 1,200-h.p. 520-r.p.m. motor. Its hourly output of ore is 185 tons.

Allied Ironfounders Buys J. S. & F. Folkard

BUSINESS of J. S. & F. Folkard, Limited, producers of plumbing equipment in plastics and brass, of London, has been acquired by Allied Ironfounders, Limited. Distributed under the trade names of Vulcathene and Vultex, the products include specialized lines for use in hospitals, laboratories, and atomic installations. Vulcathene plumbing equipment provides a range of pipes and fittings for use where active corrosive attack is present, and a high proportion of the output is exported.

Mr. G. S. Steven, chairman of Allied Ironfounders, stated that the products of Folkard would be complementary to those for which production had already been planned by the group. Allied Ironfounders would continue to have the advice and experience of Mr. F. J. Folkard, chairman and managing director, his fellow directors, and the staff.

Steel and Aluminium Battle for US "Can" Market

LEADING steel and aluminium producers in the US have simultaneously moved ahead with major new products developed to carry on the rivalry between the two metals for the can manufacturing market. The US Steel Corporation's weapon is a new type of tin-plated steel about half as thick as the material currently used to make "tin" cans and priced well below conventional tinplate.

Aluminium has a new can top that a consumer can open by pulling on a tab—eliminating the use of a can opener. It was developed by the Aluminium Company of America and the United Shoe Machinery Corporation.

US Steel Corporation said that it will sell "Ferrolite," as it has named the ultra-thin product, in the price range from $6.10 to $6.65 a base box and that it will be produced in weights ranging from 45 to 60 lb. a base box. These prices are as much as $1.30 under the price on standard weight tin plate.

Of the two moves it is expected that US Steel's will have the more immediate impact.

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T2GH Auto-Loader

Air-powered Loaders and Dumpers for every underground requirement

Headroom, track gauge, car size, clean-up range . . . you take all these into consideration before you buy loaders! That's why you should know about the Atlas Copco range. This includes loaders and dumpers to meet every requirement in underground work and to handle all kinds of muck—abrasive, sticky or free-running—with equal efficiency.

Auto-Loaders

T2G and T2GH auto-loaders allow one man to carry out the complete mucking operation—loading, transporting and dumping. As a result, labour costs are considerably reduced. Fitted with pneumatic tyres, these highly manœuvrable loaders put up excellent performances in both confined spaces and wide areas. Maintenance costs are lower as the rubber tyres help to reduce stress on the loaders. The T2G dumps directly into chutes or ore pockets, whilst the T2GH has a greater dumping height allowing it to discharge directly on to conveyors.

LM Loaders (rail-mounted)

Loaders in the LM series have bucket capacities ranging from 4 to 21 cubic feet and clean-up ranges from 6′ to 12′ 5″ (1.8 to 3.8 m.) without side-ploughs. The medium-sized model of this series is the LM56. Fitted with pneumatic side-swinging and quick-action controls, this machine is designed to reduce operator fatigue and increase loading capacity. In fact, with a bucket capacity of 7 cubic feet and a clean-up range of 8′ 8″ (2.7m³), it has a loading capacity in excess of any other loader of comparable size!

WRITE FOR LITERATURE—Further information about Atlas Copco loaders and dumpers is given in a series of leaflets and folders—readily available on request. Write for copies to your local Atlas Copco company or agent or to the address below.

Sales and service in ninety countries

With companies or agents in ninety countries, Atlas Copco is the world's largest organisation specialising solely in compressed air equipment. Products include stationary and portable compressors, rock drills, loaders, hoists, paint-spraying equipment and air tools of every description. Wherever you are, the international Atlas Copco group offers expert advice on the selection of equipment and provides a complete after-sales service.

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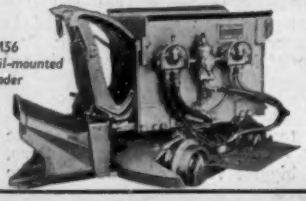
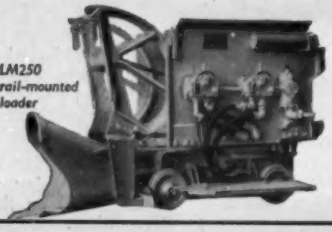


LM56 rail-mounted loader



LM250 rail-mounted loader

T2G Auto-loader

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D170

Big Expansion Project for Italian Steel

IRON and steel industry in Italy, which ranks as the eighth largest in the world, has made a good recovery from the recession of 1958, and is now going ahead with a large expansion programme. An indication of the size of this is given by the chairman of FINSIDER (Società Finanziaria Siderurgica per Azioni), Prof. Ernesto Manuelli, in his report to the annual meeting of the group.

FINSIDER, the largest Italian iron and steel group, is at present pressing ahead with an expansion programme which over the next five years will raise its annual output of pig-iron to 5,400,000 tons, and that of steel to 7,200,000 tons. This represents substantial increases over the group's present output. It will also have a major effect on the output of the entire Italian industry, which in 1959 was 2,100,000 tons of pig-iron and 6,800,000 tons of steel.

The report states that FINSIDER will continue the work of concentrating and specializing production in its existing plants, with particular reference to the development of production in the fully integrated plants at Bagnoli, Cornigliano and Piombino. The group will build a new iron and steel combine at Taranto for the production of a full range of rolled steel products and welded tubes, and will develop its cold rolling capacity by installing a new up-to-date rolling mill at Novi Ligure.

Applications of Stainless Steel in Architecture

USE of stainless steel in architecture is the subject of an exhibition which opened on Monday at the Royal Institute of British Architects in London. The exhibition, which is being presented by the Stainless Steel Manufacturers' Association, has been brought from the USA and includes examples of curtain wall panels, window frames, and other applications in stainless steel.

In connection with the exhibition, a lecture on "Recent Developments in the Architectural Uses of Stainless Steel in the USA" was delivered on Monday evening by Prof. George Edson Danforth, director of the department of architecture at the Illinois Institute of Technology, who was introduced by Dr. Charles Sykes, chairman of Firth-Vickers Stainless Steels, Limited.

WEIR-CLARKE AGREEMENT ON AIR COMPRESSORS

GLASGOW engineers and founders, G. & J. Weir, Limited, which was licensed last year by Clark Bros. Company division of Dresser, AG, to build Clark centrifugal and reciprocating compressors, will now also manufacture the Clark line of Isotemp packaged centrifugal air compressors.

Designed in seven frame sizes, with capacities ranging from 5,000 to more than 50,000 cu. ft. per minute, the new Weir-Clark isotemp compressors will provide air of highest purity at a primary pressure of 110 lb. per sq. in. for tonnage oxygen plants and other industrial uses.

New 12-ft. Plate Mill at Appleby-Frodingham

NEW 6,000-h.p. reversing 12-ft. plate roughing mill with twin motor drive equipment supplied by the heavy plant division of Associated Electrical Industries, Limited, has been commissioned at the Scunthorpe works of Appleby-Frodingham Steel Company, branch of the United Steel Companies, Limited. The mill is designed to reduce slabs weighing up to 25,000 lb. down to sizes suitable for rolling in the 12-ft. plate finishing mill commissioned in 1958, the drive for which was also supplied by AEI.

The new mill is of conventional two-high construction, with 46-in. diameter rolls directly driven by two 3,000-h.p. 40/80 r.p.m. d.c. motors with a peak output of 18,000 h.p. The motors are Ward-Leonard, controlled from a motor generator set comprising four 1,600-kW generators driven by a 6,000-h.p. induction motor through a 32-ton flywheel. The set is a duplicate of that used for the finishing mill.

Arthur Lee Establishes New Pension Scheme

COMPOSITE pension and life assurance scheme for works employees of Arthur Lee & Sons, Limited, steelmakers, of Sheffield, is to be introduced on October 1. The plan has been designed in consultation with Metropolitan Pensions Association, Limited, London, S.W.1.

It embraces a "Q" scheme designed to enable the company to contract out of the State scheme, and provides for all adult male works employees, who have completed one year's service with the company, an annual pension of £4 6s. 2d. for each year of contribution by the employee at 4s. a week. Arthur Lee is paying for the balance of the pension for future service and is also providing a past service pension at the rate of £1 a year for each year of eligible past service. The plan includes a life assurance benefit.

Obituary

The death has occurred of Mr. RALPH FISHER, coal preparation manager of Blackhall Colliery (Co. Durham). He was 43.

Mr. JAMES REYNOLDS, who spent 50 years in the mines—20 of them as a deputy at Murton Colliery (Co. Durham)—has died at the age of 73.

The death occurred on August 25 of Mr. FREDERICK EDWARD WALTERS, managing director of Salopian Industries (Metals), Limited, structural equipment manufacturers, of Battlefield, Shrewsbury. He was 65.

The death has occurred of Mr. CHARLES CLEGG, director of Chas. Martin & Company, Limited, engineers, millwrights, and machine tool makers, of Gateshead. He joined the company after he retired in 1951 as works manager of Steels Engineering Products, Limited, Sunderland, which company he joined in 1946.

TANKER of 38,000 tons nearing completion at the Sunderland shipyard of J. L. Thompson & Sons, Limited, will be the biggest vessel ever built on the River Wear.

Compactness in Underground Air Compressors

A Class RE 'Power Vane' Rotary Electric Compressor specially designed as a Mine-Car unit for underground service in South Africa. Standard units with air or water cooling are available as stationary machines.

A typical example of how the compactness of the 'Power Vane' Rotary Air Compressor can meet the answer for special underground service is shown in this very low height mine-car unit.

Although the standard 'Power Vane' rotary stationary compressor has different dimensions it is the most compact machine of its class in mining operation today.

'Power Vane' rotary units are water cooled for surface operation or air cooled with flameproof drive and complete protection equipment for underground service.

Comprehensive literature is available on request.

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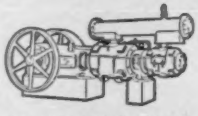
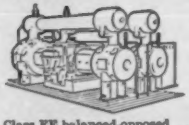


Class T straight line, double-acting, single and multi-stage compressors for outputs up to 745 c.f.m. or pressures up to 2,500 p.s.i.



Class FE balanced-opposed multi-cylinder compressors for outputs up to 8,000 c.f.m. or pressures up to 5,000 p.s.i.

Class RE electrically driven Rotary Air Compressors for outputs up to 510 c.f.m. at 100 p.s.i.

Class F two-stage air-cooled compressors for outputs up to 477 c.f.m. at 100 p.s.i.

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Domestic Coal Output Drops: Board Drawing From Stocks

COAL for domestic use is being drawn from stocks in Warwickshire by the West Midlands Coal Board because of decreasing production from collieries in the Area. Production of all types of coal for the first 30 weeks of this year has shown a drop of 1,000,000 tons. A spokesman for the board said last week that for a number of reasons some coal merchants were short of domestic supplies, but there was no overall shortage. Holidays and the lack of manpower in the pits had led to the need to draw on stocks.

Production during the first 30 weeks of 1960 was 8,500,000—1,000,000 tons below the 1959 figure. At the end of July this year manpower was 44,500—8,000 fewer than in the corresponding period in 1958. The spokesman added: "Our present stock of all kinds of coal is about 3,000,000 tons, of which 500,000 tons is house coal. There is no shortage of industrial fuel.

"The decrease in production is not entirely because of manpower. It is also due to some rearrangements of output to tie up with demand. Formerly there has been over-production. Because of the number of men leaving the pits, we will be drawing more heavily than expected on stocks, but there is plenty to see us through the winter."

Use of Refuges Urged After Shotfiring Fatality

PIECE of clay the size of a walnut killed a 35-year-old miner at Monckton No. 3 Colliery, an inquest at Royston (Yorks) was told last week. The clay, part of a plug used in a shot-firing operation, hurtled 61 yds. along an underground roadway and struck Mr. J. F. Mills, who was sheltering with two other men in what was considered to be a safe position.

Deputy Mr. George Wright, who fired the shot, said he moved the men to what he considered to be a safe position 61 yds. away while he fired the shot from the cover of some packing 30 yds. away. He agreed that a produced plan of the mine showed no refuges in use. Manholes had been made, but because of side pressure they had become unsafe. Returning a verdict of Misadventure, the jury said it felt that refuges should be provided wherever possible.

An "Answer" to Coal Critics

OPENING the gala of the No. 5 Area, North-Eastern Divisional Coal Board, at Barnsley on Saturday, Mr. W. H. Sales, divisional chairman, said the equipment on view answered critics who claimed that the mining industry was finished. He commented: "I wish we were so far advanced in our social thinking in the industry. There is either a tendency to bury one's head in the sand and pretend that the problems do not exist, or attempt to solve such problems with nineteenth-century mental equipment."

A full-scale exhibition containing mining machinery set in reconstructions of coal seams was the highlight of the gala.

THE STEEL COMPANY OF WALES, LIMITED, has decided to take part in the State graduated pension scheme.

Coal Stocks Position

DETAILS of coal stocks as at August 27, 1960, compared with those available at August 29, 1959, are given in the appended table issued by the Ministry of Power.

Figures in parentheses, mainly calculated on the basis of requirements during the winter, indicate the total weeks which the tonnage in stock would last.

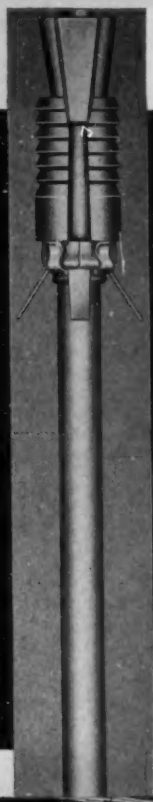
Week ended:—	Aug. 27, 1960.	Aug. 29, 1959.
	Thous. tons.	Thous. tons.
Distributed stocks—		
Public-utility undertakings—		
Gas	1,854 (3.6)	2,453 (4.2)
Electricity	5,971 (5.1)	6,840 (6.9)
Railways	486 (2.6)	500 (2.6)
Coke ovens	1,150 (2.1)	1,040 (2.1)
Industrial consumers—		
Iron and steel	188 (2.2)	187 (2.2)
Engineering and other metal industries	250 (2.8)	318 (3.6)
Other industries	1,676 (3.2)	1,840 (3.5)
TOTAL INDUSTRIES	2,114	2,345
Merchants' stocks—		
(*a*) House coal	1,211 (1.6)	1,504 (2.0)
(*b*) Anthracite and boiler fuel	181 (3.0)	184 (3.1)
Miscellaneous (estimated)	329	380
TOTAL DISTRIBUTED STOCKS	13,296	15,257
Undistributed stocks—		
At collieries (on ground and in wagons)	28,044	24,922
At open-cast sites	6,546	6,727
TOTAL UNDISTRIBUTED STOCKS	34,590	31,649

Ex-Miners Are Returning in the Scottish Coalfield

RECRUITING campaign in the Scottish coalfield has met with an "encouraging" response, particularly from miners who had left the industry. A spokesman for the West Ayr Area of the Scottish Divisional Coal Board said that offers to ex-miners of employment at Blair (Dalry), Sorn, Littlemill (Rankinston), Killochan and Maxwell (Dailly) collieries had met with the response hoped for, although more men would still be needed to meet wastage which was expected in the pits. At one colliery, Killoch, near Ochiltree, about 2,000 recruits were likely to be needed.

Industrial relations officer for the East Ayr Area, Mr. G. Shepherd, said the campaign in his area was still in its early stages, but recruitment through Press advertising and labour exchanges was already higher than had been hoped.

DEEPEST COAL MINE in Japan has been completed at the Hombetsu Colliery on the island of Hokkaido, with a 4,132 ft. shaft which is the first completely automatic mining shaft in the country. It is capable of hauling 1,200,000 tons of coal a year and the company claims that the shaft is accident proof.



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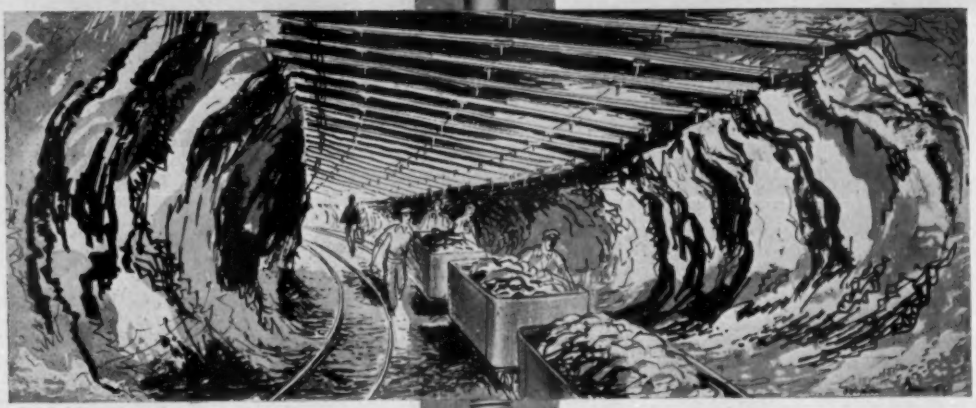
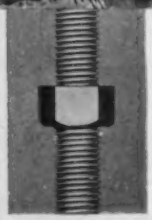
Over one million BJB Rock Bolts have now been sold for use in mines, tunnels, and deep excavations. Not only do they have an unparalleled record for safety but statistics also prove that, in some installations, savings of 30% or more have been achieved and we shall be glad to let you have particulars on request.





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Ruston & Hornsby Faces Rising Costs

EARNINGS in terms of a return on capital employed by Ruston & Hornsby, Limited, engineers, oil and gas engine manufacturers, boilermakers, etc., of Lincoln, continue to disappoint, states Mr. W. J. Ruston, the chairman. It stems, he says, not only from narrow profit margins on sales but also from under-employment of capacity. The latter is a matter with which the company is actively concerned both by stimulating additional production of existing products and by using excess capacity from obsolete lines on new products.

Compared with 1959 there had been an increase in output, but it had not been spread evenly throughout the organization. Some very interesting business had been secured from abroad for engines, locomotives, and turbines, Mr. Ruston said. Some of these contracts involved extended credit terms. The company needed to expand its oversea outlets and with regard to exports Mr. Ruston thought that more Government backing was needed in British industry.

Group profit for the year ended March 31, 1960, was £986,935, a rise of £5,990 on the previous year. Dividend is restored to 9 (8) per cent.

ASSOCIATED PORTLAND CEMENT PROPOSALS

PROPOSALS by Associated Portland Cement Manufacturers, Limited, for the substitution of group securities for the outside interest in subsidiaries have been announced. Every £100 of British Portland Cement Manufacturers, Limited, £1,680,000 6 per cent. cumulative preference stock will be exchanged for £110 of 5½ per cent. unsecured loan stock, 1984/2009 of Associated Portland.

The £303,466 outstanding 3½ per cent. first mortgage debenture stock of Alpha Cement, Limited, not owned by Associated Portland, is to be exchanged for £318.640 3½ per cent. debenture stock of Associated Portland (forming part of the present authorized amount of £1,500,000 which is now the only debenture stock of Associated Portland outstanding) on the basis of £105 Associated Portland debenture stock for every £100 of Alpha.

Holders of the £779,500 Alpha 5½ per cent. cumulative preference stock not already owned by the parent are offered exchange into 5½ per cent. loan stock, 1984/2009, of Associated Portland on the basis of £100 loan stock for every £100 of preference stock.

Delta Metal Sells Copper Tube Concern

COPPER alloy tube manufacturing company which Yorkshire Imperial Metals, Limited, recently announced its intention to acquire, has been named as Booth & Mapplebeck, Limited, a member of the Delta Metal Company, Limited, group. Delta is to take a minority interest in Yorkshire Imperial Metals, which is jointly owned by Imperial Chemical Industries, Limited, and Yorkshire Copper Works, Limited, and which was formed in 1958 to combine the copper and alloy tube interests of those companies.

The acquisition, it is stated, will not affect the production of copper tube by the Delta group through its subsidiary, Earle Bourne & Company, Limited.

Ore Chartering

MANGANESE ore from Port Elizabeth reports 8,700 tons to Middlesbrough for late September/October at 46s. and a similar rate to 8,800 tons for Birkenhead for October 20/November 15. The West African market is not particularly active although Monrovia to Weser range reports 10,000 tons for September at 26s. 9d.

No ore fixtures are reported from the Mediterranean area to the Continent and there is no particular inquiry although there is a fair miscellaneous demand. Pyrites reports 6,200 tons from Huelva to Sluiskill at 23s. for September 1/15 and there are other inquiries for Continental account and some small interest to this side. Vassiliko Bay/Rotterdam paid 25s. for 9,500 tons late September. The phosphate market from Casablanca to the UK is rather quiet. On the other hand, Tampa/West Coast UK including Portishead, paid 51s. for 4,200 tons September/October loading and Tampa/Japan $8.00 f.i.o. prompt for 9,500 tons September 1/15.

Law Report

MINER ENDANGERED PIT CAGE

MINER at Nine Mile Point Colliery, Wattsville (Mon) was fined a total of £40 at Blackwood Magistrates' Court for entering the pit cage without authority, endangering the safety of another worker, and obstructing the colliery hitcher and assaulting him, causing him bodily harm. He was ordered to pay costs of £10 10s.

Colonel K. D. Treasure, prosecuting for the Coal Board on the first three charges, said Haines was refused permission to travel in the cage by the hitcher because his name did not appear on the authorized list. When he tried to get into the cage with six other men, he was seen by the hitcher and told he would be reported. When the hitcher gave the signal for the cage to be drawn up, Haines jumped on him and kicked him. When the hitcher again tried to signal, Haines jumped on him once more and as a result the cage was brought to a standstill in the shaft.

Colonel Treasure said that Haines's behaviour at the pit bottom had endangered the safety of the hitcher, and of the men in the cage. The Coal Board took an extremely serious view of the matter.

Fall in Tractor Demand Leads to Redundances

WEAKNESS in home demand for tractors and farm machinery has caused the redundancy of about 100 workers at the Bradford factory of International Harvester Company of Great Britain, Limited, and another 200 may receive notice today (Friday). A company spokesman said this week that there had been a cut in the production programme. "The market is not what it was and business has not been so brisk lately."

In the first seven months of this year the farm machinery industry sold 12 per cent. fewer tractors than in the same period of 1959 and sales of implements dropped by 18 per cent. The export trade, however, has remained buoyant, tractor exports showing a 40 per cent. rise in the first seven months.

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AP 72

Yorkshire Coke-oven Workers' Dispute

SOME 600 workers at Manvers Main coke ovens, near Mexborough (Yorks), which supply 20 per cent. of the gas needs of the Sheffield and Rotherham area, came out on an unofficial strike on Tuesday. They are claiming a flat increase of 5s. a shift for all grades and have already turned down a NCB offer of 2s. 1d. a shift for tradesmen and 11d. for other grades.

Volunteers from offices and men from other plants are manning the ovens and have kept the level of production to about 50 per cent.

An attempt by the strikers on Tuesday to spread the stoppage to the Coal Board's Avenue plant at Wingerworth, near Chesterfield (Derbyshire), failed. Wingerworth, which employs 530 men and takes in a greater area than any other European plant, supplies gas to Chesterfield, Derby, and Leicester. An official of the plant said: "We have never had a strike here and there is no danger of one this time. We are confident that the attempt failed."

The 600 men on strike are to hold a meeting today (Friday).

COKE MARKET AFFECTS SADLER & COMPANY

DEPENDENCE of Sadler & Company, Limited, tar distillers and chemical manufacturers, of Middlesbrough, on the coke market was referred to by Mr. G. H. C. Sprot, the chairman, in his review of 1959.

On the one hand, he said, the company produced coke, gas, coal tar, and other by-products. On the other it distilled crude tar produced by the National Coal Board and the Northern Gas Board and manufactured sulphuric acid used in coal carbonization plants in the north-east. During a depression in the call for coke the company had to restrict production, thus lowering the profits of the coke ovens, and if production was restricted there was not sufficient crude tar to run the distillation plant at maximum level, and sulphuric acid sales fell.

Mr. Sprot regarded the strengthened market for coal tar by-products resulting from the decrease in coal carbonization, as a heartening trend.

Arniston Coal Company to Wind Up

FINAL meeting of the Arniston Coal Company, Limited—in members' voluntary liquidation—which was delayed until the House of Lords had given judgment on an appeal lodged by colliery companies against certain tax deductions, has been convened for September 30. This follows the passing of the Finance Bill 1960 which contains provisions which nullify any benefit the company might have obtained from the Lords' decision.

In view of this the joint liquidators, Mr. R. Ian Marshall and Mr. K. A. McLellan, state that there is no longer any purpose in continuing the liquidation and the company will be wound up at the final meeting.

NCB Ideas Competition

PRIZES totalling £5,000 are being offered by the National Coal Board in a competition for original ideas and suggestions that will help in the disposal of coal. The competition is open to all NCB employees, and entries are invited covering the promotion of the sale of coal and other types of solid fuel, their storage, distribution and usage and, in general, devices to make solid fuel more attractive to consumers.

The competition will last for two months, September and October, 1960, and all entries must be received by October 31. Entries must be sent to the competition secretary at Divisional headquarters of the division in which the competitor works, or in the case of entries from national headquarters and headquarters controlled outstations to the Competition Secretary, Headquarters Panel, c/o Marketing Department, Hobart House, London, S.W.1.

Argyll Colliery Resumes Work

FIRE at Argyll Colliery, which lasted for 12 days, is now out. A spokesman for the NCB said that by the middle of last week samples from the affected section showed no traces of combustion gases. Coal board officials described the fire as a "heating," since there were no flames and little smoke.

The mine rescue teams from Coatbridge have returned to their depot and work has begun on driving a new shaft in the stone mines area. When this is finished in about six months' time all the old workings, including the section where the fire occurred, will be sealed off by flooding.

Redundancy notices which were served on the 200 employees at the pit have been withdrawn and work on a limited scale has been resumed near the pit bottom. There will be no cut in the number of workers at the mine.

DERBYSHIRE MINE CLOSURE RUMOUR DENIED

BOTH the National Coal Board and the National Union of Mineworkers have denied the rumour that Westhorpe Colliery (Derbyshire) is to close. The Coal Board spokesmen said that the rumour probably started over a misconception of the board's plans for the mine.

Mr. P. J. Griffiths, the colliery manager, explained the new scheme to miners and NUM representatives at a meeting on Sunday. He said that at present 60 per cent. of the total output came from the Flockton Seam and 40 per cent. from the Thorncliffe Seam. In future the ratios would be reversed. He assured the men that there would be no redundancy. An NUM official said that the plan was in line with the board's policy of increasing production of saleable coal.

FINAL UNEMPLOYMENT FIGURES at August 15, issued by the Ministry of Labour, show that 321,357 people were without jobs. The main changes in the unemployment pattern between July 11 and mid-August were reductions of 2,400 in shipbuilding and marine engineering and increases of 1,200 in both engineering and electrical goods. The number of unfilled vacancies in coal mining rose by 2,000.

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